Original Research Paper

Pulmonary Medicine

PREVALENCE OF ORGANISMS OF COMMUNITY ACQUIRED PNEUMONIA AT KURNOOL MEDICAL COLLEGE

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ABSTRACT

Introduction: Pneumonia is the commonest respiratory infection with a significant morbidity and of mortality despite the availability of potent antibiotics .AIM- Study of bacteriological profile of community acquired pneumonia (CAP) in adults at kurnool medical college.

Materials and Methods: Prospective observational study was conducted on 120 hospitalized patients diagnosed with CAP during Jan 2016-june 2018, after taking consent. Investigations like sputum culture, blood culture, antibiotic sensitivity test, chest-X-ray, LFT, RFT, CBP, RBS were done. After admission, empirical antibiotics were started and changed after obtaining antibiotic sensitivity pattern. Symptomatic treatment given as needed. Comorbid illness recorded and treated.

Results: Among 120 patients,causuative agent was cultured in 85 patients. males-63, females-22.. Sputum culture was positive in 70.9% . In Sputum culture organisms isolated were klebsiella followed by streptococcus staphylococcus,pseudomonas,eschereria coli.. In our study organisms were sensitive to amoxyclav (81%), gentamicin (64%), amikacin (50%), fluoroquinolones (37%). Co-morbid conditions associated with CAP - smoking (43%), diabetes(22%), COPD(13%), Hypertension(4%). Out of 120 patients 97 recovered. Death occurred in 3 patients in which organisms were resistant to amoxyclav and were associated with co-morbid illness COPD and smoking.

Conclusion: The most common age group affected were(48-57 years) , common organisms isolated were klebsiella- sensitive to amoxyclav, gentamicin, amikacin. Mortality is more in patients infected with resistant organisms and associated co-morbid diseases like COPD, diabetes. Knowledge about common pathogenic organism for CAP and their antibiotic sensitivity pattern helps in appropriate empirical treatment and better outcome.

KEYWORDS : CAP-Community Acquired Pneumonia, Chest X-Ray, Copd, Sputum Culture

INTRODUCTION:

Pneumonia is a term that usually denotes inflammation of lung parenchyma due to an infectious agent. The infectious agent can be either bacteria, virus, parasite or rickettsial etc depending upon the circumstances of the host and its underlying immune status1-CAP is an acute illness acquired in the community with symptoms suggestive of LRTI with the presence of intrapulmonary shadowing in the chest radiograph which is likely to be new and has no clear alternative cause 2,3

AIMS AND OBJECTIVES:

1. To correlate clinical and bacteriological profile of CAP.
2. To know common organism responsible for CAP among patients who attended the Department of Pulmonary Medicine, Government General Hospital, Kurnool.

MATERIALS AND METHODS :

Study Design: Prospective Observational Study. Study Period: January 2017 to August 2018.

Size of sample:

120 number of patients diagnosed as CAP is admitted from January 2017 to August 2018 in pulmonary medicine department, Government General Hospital, Kurnool

Study population:

About 120 adult patients diagnosed as having a CAP in the department of pulmonary medicine, Government General Hospital, Kurnool Medical College, Kurnool included in the study.

Materials and methods

1. Complete haemogram
2. Liver function test
3. Renal function test.
4. HIV status
5. ECG
6. Chest X-ray PA view
7. Sputum for culture and sensitivity.
8. Sputum for gram stain
9. Blood culture for pyogenic organisms
10. Ultrasound Chest
11. Oxygen saturation
12. ABG Analysis and CT chest whenever necessary.

Inclusion Criteria:

A. All age groups for more than 18 years.
B. Clinical symptoms like fever, cough with (or) without expectoration, pleuritic chest pain, dyspnea, and altered sensorium.
C. Clinical signs like tachypnea, reduced breath sounds, increased vocal fremitus, and vocal resonance and crepitations.
D. Radiological evidence of pneumonia without any clinical evidence of pneumonia will also include.
E. Co-morbid conditions – Diabetes, COPD, renal failure.

Exclusion Criteria:

A. Age group of less than 18 years.
B. Lung malignancies.
C. HIV positive status
D. Tuberculosis.

E. Patient not willing for consent.
F. Hospital-acquired pneumonia i.e., Patients hospitalized in the previous 14 days.

RESULTS :
Total number of patients taken:120,Culture positive: 85,Negative: 15. Out of 85 patients, 63 (74%) were males 22 (26%) were females. Predominant age group affected was 48-57 years for both males and females .In the present study out of 85 patients, in Sputum culture Klebsiell apneumoniae 34 (40%) Streptococcus 28 (32.94%), Staphylococcus 16 (18.82%), Pseudomonas coli 4 (4.70%), Escherichiacoli 3 (3.52%) were the organisms isolated.

GENDER WISE DISTRIBUTION ANALYSIS
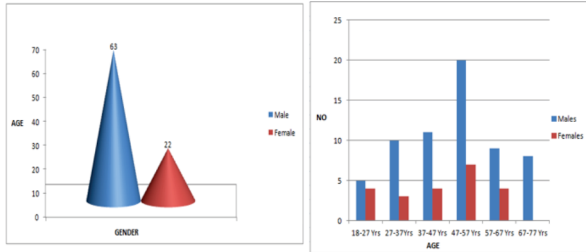
Sl. No	Symptoms	N	%
1	Fever	80	94.12
2	Cough	80	94.12
3	Breathlessness	78	91.76
4	Expectoration	68	80.00
5	Chest pain	40	47.06
6	Haemoptysis	19	22.35

Organism	Sputum Culture No %
Klebsiella Pneumonia	34 (40%)
Streptococcus pneumonia	28(32.94%)
Staph aureus	16 (18.82%)
Pseudomonas	4(4.70%)
Eschereria coli	3(3.52%)
TOTAL	85 (100%)

DISCUSSION :
 In the present study out of 85 patients, 74% were males and 26% were females with a male to female ratio 2.9:1

Our results were in conjunction with the results with Vinay Dharmadhikari[4] et al (72%), Bin Bilal[5]et al.,(70%) in which males were the predominant group compared to females.

Males are more frequently affected than their females counterparts owing to risk factors like smoking, alcoholism, occupation associated development of COPD. This might be due to physiological immunechanges, changes in the architecture of lungs and high incidence of chronic diseases in these groups. This results in treatment with medications like steroids, chemotherapeutic agents which results in further immunosuppression predisposing to community-acquired pneumonia.

In our study, in the age group 68-77, affected were all males due to associated co-morbidities which predispose to pneumonia

Age group ranging from 18-77 years with mean age is 47.91. presenting symptoms were fever (94.12%), cough (94.12%), breathlessness (91.76%), expectoration (80%) chest pain (47%) and hemoptysis (22%).

Majority of patients had lesions in right lower zone (27%) followed by right middle zone (22%), left lower zone (18%), left upper zone(16%) right upper zone 13% and multilobar in 2% patients

Smoking was the most common co-morbid condition[24] (28.33%) in our present study. Similar results were seen in Kodur Ramamurthy[6]et al.,(28%) kejriwal[7] et al., (33.3%). The increased risk of pneumonia in smokers is due to alteration in respiratory flora clearance and cellular defenses. Bacterial colonization of lower respiratory tract is more prevalent in smokers than nonsmokers, mucociliaryclearance is defective, owing to a reduction in ciliary beat frequency and change in volume and viscoelastic properties of respiratory secretions.

68% of the patients were from rural population and majority were daily wageworkers and manual laborers belonging to low economic status. This is consistent with a previous study as mentioned by Loeb[8] MB who described the highest frequency of CAP among the low socioeconomic class. It is probably attributed to the non-affordability of costly treatment at an early stage due to poverty prevailing in our region which predisposes high mortality and severity of CAP. This is contrary with the findings of Lave[9] JR and Fine[9] MJ who mentioned that rural residents have fewer complications, less cost of treatment and are more rapidly discharged as compared to urban patients. This difference is due to their own explanation that rural patients were treated by local quacks, dispensers and indigenous drug healers at an early stage due to wide spread illiteracy(68%) among them as quoted in our study

Pallor (14.35%), cyanosis (5%), icterus (7%) clubbing (4%) patients were seen in the present study which correlates with the results by Bilal[5] et al.Pallor is due to hepcidin production which increases during inflammation, suppresses erythropoiesis and depletes the iron depot leading to anemia1.

Icterus may be due to direct invasion of the parenchyma by the infectious organisms or to structural or functional changes caused by circulating toxins10. Central cyanosis is due to intrapulmonary shunting of blood through consolidated lung1.

Majority of patients had lesions in right lower zone (27%) followed by right middle zone (22%), left lower zone (18%), left upper zone(16%) right upper zone 13% and multilobar in 2% patients. The right lower zone was the most   common zone involved in the which is similar to studies done by venugopal[11] et al., chalapathi[13] rao(18%) .klebsiella was isolated (20%) in the present study in right lower lobes .our results were in conjunction with R.S.Pushpa kumari[14] (14%). The right side is more common than left side that is generally caused by aspiration of the organism from the oropharynx, presumably by patients in the supine position1

Gram-positive organisms and gram–negative organisms were isolated (48.22%), (53%) respectively

The most frequent pathogen isolated were Klebsiella pneumonia(40%) followed by Streptococcus (29%), Staphylococcus aureus (18%), Escherichiacoli (7%)and Pseudomonas (5%). Similar results were observed in the study by Shilpi Dhakre[15] in which Klebsiella (32.08%) was the predominant organism followed by pseudomonas (28.34%), Escherichiacoli (13.36%) Streptococcus (5.34%), staphylococci (1.76%) were the organisms isolated.

Similar studies were done by Syed Mushtaq Ahmed[16] et al (41.95%) and siddalingappa[17] et al (51.1%) in which Klebsiella was the predominant organism isolated.Gram-positive organisms and gram–negative organisms were isolated (48.22%), (53%) respectively Bacteriological etiology was found only in 70.9% of cases. Results of Bansal[17]et al(75.6%), Mythri[18]et al (72%) were consistent with our study

Mortality in the present study was 4%. Mortality in the present study was seen in 3 patients, two males(>50yrs) and one female(<50yrs).In two male patients, streptococcus was isolated in blood culture and sputum culture which was resistant to conventional antibiotics(amoxiclav, azithromycin).   Copd and smoking were associated with comorbid conditions in these patients.

CONCLUSIONS :
Most common in males. Most common affected age 48- 57 years. Common presenting symptoms were fever, cough. Common comorbid conditionwas smoking and   COPD.Common chest x-ray involvement was right lower zone. Most common sign was pallor followed icterus.Most common organism isolated was Klebsiella (40%) followed by Streptococcus (32.94%), Staphylococcus (18.82%), Pseudomonas (4.7%) and Escherichiacoli (3.52%).Resistance to amoxiclav was seen in Klebsiella (82%), Streptococcus (11%), Staphylococcus (38%), Eschereria coli (34%), Pseudomonas (100%).In the present study, bothgram-positive and gram-negative organisms were isolated equally. Among the gram-negative Klebsiella was the most common organism constituting 40% of the total isolates. The other two gram-negative organisms which include Escherichia coli and Pseudomonas accounted only for about 8% of thetotal isolates.

Among the gram-positive organisms, streptococcus was the predominant isolate (32.94%) followed by Staphylococcus aureus (18.82%).

LIMITATIONS : Sample size is small

Relevant outcomes such as speed of response, subsequent relapse rates, and harmful antibiotic effects and health economic burden of different antibiotic treatment regimens were not assessed.

Serological tests to identify atypical organisms and viral pneumonias were not carried out in this study. Antimicrobials tested for sensitivity in this study have not included the newer, costlier drugs. Severity scores like CURB 65, PSI were not assessed

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