International Journal of Research in Medical Sciences
Lamb A et al. Int J Res Med Sci. 2018 Jul;6(7):2271-2274
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20182404

Original Research Article

Management and outcome of community acquired pneumonia: hospital based study

Avinash Lamb, Amol Harinathrao Patil*

Department of Pulmonary Medicine, Government Medical College and Hospital, Aurangabad, Maharashtra, India

Received: 22 May 2018
Accepted: 24 May 2018

***Correspondence:**
Dr. Amol Harinathrao Patil,
E-mail: amolhpatil@gmail.com

ABSTRACT

Background: Lower Respiratory Tract infections are responsible for one-fifth of the deaths caused due to infectious diseases in India and Pneumonia is a major culprit. Timely and appropriate empirical treatment based on knowledge of local etiological factors is important in the management of the disease. Data related to investigation profile and therapy as well as morbidity and mortality is available from different geographic regions. Present study describes the management and outcome of disease data from a tertiary hospital at Rajkot in Gujarat state during the study period.
Methods: The present prospective observational study was completed in the study duration (November 2014 to April 2016) at tuberculosis and chest diseases Department of PDU Hospital at Rajkot, Gujarat. 50 patients above 12 years of age with CAP on clinical diagnosis assisted by radiology were included in the study. The haematology profile, therapy, complications and mortality were described.
Results: Haemoglobin was below 10gm percent in 22% cases. Leucocytosis was observed in 72% cases. Ten percent patients were seropositive for HIV. There was a moderate response to treatment with penicillin group of drugs (approximately 22%). Many patients had to be offered other group of drugs like Cephalosporins, macrolides and quinolones for clinical response. Most common complications observed were: Delayed resolution in 12 (24%) patients, synpneumonic effusion in 6 (12%) and septicaemia in 3 (6%) patients. Mortality rate was 6% during the study period.
Conclusions: The results indicate a low response to treatment by penicillin group antibiotics and a high rate of complications. Mortality is similar to reports from India.

Keywords: Cephalosporins, Mortality, Penicillin

INTRODUCTION

Community acquired Pneumonia (CAP) is a commonly encountered diagnosis by the general medical practitioners as well as the pulmonary medicine specialists. The diagnosis is based on the clinical findings and/or the radiologic features. Community acquired pneumonia is among the leading causes of death especially in the developing countries and it has been reported to cause around a million deaths every year among the adult population in the Asian continent. Mortality data specific to the community acquired pneumonia is not available for the Indian population, however, lower respiratory tract infections are responsible for around one-fifth of the deaths caused due to infectious diseases in India and pneumonia is a major culprit.

Timely and appropriate empirical treatment of the community acquired pneumonia based on the background knowledge of the local etiological factors and the susceptibility patterns to the antibiotic drugs is important

and helpful in the management of the disease.[1-3] Despite progress in the diagnostic and therapeutic spectrum of the disease, it still has a significant morbidity as well as mortality associated with it. Data related to investigation profile and therapy as well as morbidity and mortality for the community acquired pneumonia are available from the different geographic regions across the country.[4-6] The present study describes the management and outcome of disease data during the study period from a tertiary care hospital catering to the Rajkot region in Gujarat state of India.

METHODS

The present prospective observational study describing the management and outcome of community acquired pneumonia was completed in the study duration from the November month of 2014 to April month of 2016 at the tuberculosis and chest diseases Department of the PDU Hospital, which is a tertiary care centre at Rajkot, Gujarat. 50 male or female patients above 12 years of age with community acquired pneumonia on clinical diagnosis assisted by radiology were included in the study.

Both the outpatients as well as hospitalised patients with the diagnosis of community acquired pneumonia were included in the study. Any subject who was hospitalised within last fortnight for reasons other than community acquired pneumonia was excluded. Patient information sheet regarding the study was provided to the subjects.

Informed consent was obtained from all the study participants or their legal guardian in case of minors, prior to enrolment in the study. Detailed history taking, general examination as well as systemic examination were done for all the patients. Blood samples were taken under all aseptic precautions in ethylene diamine tetra acetic acid (EDTA) vacutainers and analyzed by fully automated digital cell counter for cell counts and the erythrocyte sedimentation rate at the end of one hour was also estimated. HIV testing was done by ELISA kits.

The clinical features and epidemiology including aetiology have been described in a related separate publication. The haematology profile, therapy, complications and mortality were described.

RESULTS

Mean age of patients was 38.38±17.41 years with 40% patients aged 12 to 30 years and 28% patients aged above 50 years. Male patients were 68%. Table 1 describes the haematology profile. Haemoglobin was below 10 gram percent in 22% cases. Leucocytosis was observed in 72% of cases whereas leucopoenia was observed in 6% of cases. ESR was raised in 68% of cases. Ten percent patients were seropositive for HIV. Table 2 and 3 describes the treatment given and complications of CAP observed during the study. There was a moderate response to treatment with penicillin group of drugs (approximately 22%). Many patients had to be offered other group of drugs like cephalosporins, macrolides and quinolones for clinical response. Thus, there is growing resistance towards penicillin group of drugs. Most common complications observed were: Delayed resolution in 12 (24%) patients, synpneumonic effusion in 6 (12%) and septicaemia in 3 (6%) patients. Other complications were collapse in 2 (4%), lung abscess/empyema in 1 (2%), and pneumothorax in 1 (2%). Mortality rate was 6% with the death of 3 patients during the study period.

Table 1: Profile of laboratory investigations.

Investigation	Number of patients	(%)
Hb		
<10 gm%	11	22%
>10 gm%	39	78%
Total WBC (Count)		
4000-10000/cmm	11	22%
<4000/cmm	3	6%
10000-15000/cmm.	16	32%
15000-20000/cmm.	5	10%
>20000/cmm	15	30%
ESR		
<30 mm/1st hr (i.e. WNL)	21	42%
30-50 mm/1st hr	5	10%
>50 mm/1st hr	24	48%
HIV Seropositivity	5	10%
Sputum conclusive report (i.e. Either gram stains and/or culture sensitivity and/or AFB)	28	56%

Table 2: Primary line of treatment.

Drug	Number of patients	Percentage (%)
Penicillin group includes crystalline (or) derivatives like Amoxicillin/Ampicillin Beta-Lactam group	11	22%
Cephalosporin group	9	18%
Macrolides (Erythromycin, Azithromycin, Clarithromycin)	8	16%
Quinolones group i.e. - Ciprofloxacin, Levofloxacin	6	12%
Multiple combination drug therapy	16	32%

Table 3: Complications of CAP observed during study.

Complication	Number of patients	(%)
Delayed resolution	12	24%
Collapse (segmental or lobar)	2	4%
Synpneumonic effusion	6	12%
Lung abscess / empyema	1	2%
Pneumothorax	1	2%
Other systemic effects like shock/septicaemia	3	6%

DISCUSSION

Leucocytosis was observed in 72% of cases whereas leucopoenia was observed in 6% of cases. ESR was raised in 68% of cases. Leucopoenia (WBC Count <4000/cmm) is a minor criterion for risk stratification as per ATS-IDSA guidelines for ICU admission of patients with CAP.[7] In our study, ten percent patients were seropositive for HIV. Bacterial pneumonia has been reported to be around 25 times more likely to occur in HIV positive individuals.[8] There was a moderate response to treatment with penicillin group of drugs (approximately 22%). Many patients had to be offered other group of drugs like cephalosporins, macrolides and quinolones for clinical response. Thus, there is growing resistance towards penicillin group of drugs. Oberoi and Agrawal study from Ludhiana, Punjab has reported that for community acquired pneumonia, third generation cephalosporins, fluoroquinolones and the aminoglycosides had the best sensitivity. They attributed this finding to the higher incidence found of the gram-negative bacteria. They further suggested that judicious use of antibiotics as per sensitivity pattern can reduce the morbidity as well as deaths caused by community acquired pneumonia.[9] As per Joint ICS/NCCP (I) guidelines published in the year 2012, the empiric treatment of CAP should begin immediately in severe cases of CAP and only after the establishment of diagnosis in non-severe cases. The choice of antibiotic should take into consideration the most likely causative microorganism, local antibiotic susceptibility pattern, pharmacological properties of drugs like kinetics and dynamics, safety profile of the drug, compliance pattern and cost factor as well as the recently prescribed drugs to the patient. It was suggested that Streptococcus pneumoniae was the most frequent organism isolated and antibiotics targeting it should be used in empiric treatment. Also, commonly used antibiotics were reported to be effective against streptococcus pneumoniae with beta-lactam antibiotics and macrolides being the commonly used. The guidelines suggested avoiding the fluoroquinolones use for treatment of CAP as it is also effective against tuberculosis and can mask the tuberculosis infection.[3] Prasad and Bhat studied the clinical and microbiological profile of CAP at a tertiary care centre in Mangalore, Karnataka and reported that amoxiclav and levofloxacin were effective against Streptococcus pneumoniae with around 20% drug resistance. Cefuroxime, amoxiclav and azithromycin were effective against *H. Influenza* with around 6%, 23% and 13% resistance respectively. *K. pneumoniae* and pseudomonas spp. were effectively treated by carbapenems, cefoperazone-sulbactam and piperacillin-tazobactam with 16.6%, 42% and 39.5% resistance respectively.[10] Capoor et al, reported that in the multidrug-resistant CAP, cefepime and cefotaxime could be used.[11] In our study, the mortality rate was 6% with the death of 3 patients during the study period. Khadanga et al, study from eastern India have reported a mortality rate of 7.3% overall for CAP.[5] Shah B et al, study from Kashmir reported a high rate of mortality, i.e. 14%, which may be due to the inclusion of hospitalised patients only.[12] However, Para RA et al study from Kashmir reported a mortality rate of 8%.[6] Joint ICS/NCCP (I) guidelines published in the year 2012 mentioned that mortality rates across India vary from 3.3% to 11%.[3]

Our study has limitations like hospital-based small sample size reducing external validity of the study results. Further better designed studies will help in the analysis of treatment response patterns and outcome of disease which may help in designing prevention and better management strategies.

CONCLUSION

The results indicate a low response to treatment by penicillin group antibiotics and a high rate of complications. Mortality is similar to reports from India.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2013;380:2095-128.
2. World Health Organization. Global burden of disease (GBD). Geneva: World Health Organization; 2008. Available at: http://www.who.int/healthinfo/global_burden_disease/gbd/en/.
3. Gupta D, Agarwal R, Aggarwal AN, Singh N, Mishra N, Khilnani GC, et al. Guidelines for diagnosis and management of community-and hospital-acquired pneumonia in adults: Joint ICS/NCCP(I) recommendations. Lung India. 2012;29,Suppl S2:27-62.
4. Jain SK, Jain S, Trikha S. Study of clinical, radiological, and bacteriological profile of community-acquired pneumonia in hospitalized

patients of Gajra raja medical college, Gwalior, Central India. Int J Sci Stud. 2014;2(6):96-100.
5. Khadanga S, Karuna T, Thatoi PK, Behera SK. Changing bacteriological profile and mortality trends in community acquired pneumonia. J Global Infect Dis. 2014;6:186-8.
6. Para RA, Fomda BA, Jan RA, Shah S, Koul PA. Microbial etiology in hospitalized North Indian adults with community-acquired pneumonia. Lung India. 2018;35:108-15.
7. Mandell LA, Wunderink RG, Anzueto A, Bartlett GJ, Campbell GD, Dean NC, et al. Infectious Disease Society of American/American Thoracic Society consensus guidelines for the management of community acquired pneumonia in adults. Clin Infect Dis. 2007;44:S27-72.
8. Feikin DR, Feldman C, Schuchat A, Janoff EN. Global strategies to prevent bacterial pneumonia in adults with HIV disease. Lancet Infectious Diseases. 2004;4(7):445-55.
9. Oberoi A, Aggarwal A. Bacteriological profile, serology and antibiotic sensitivity pattern of micro-organisms from community acquired pneumonia. JK Science. 2006;8(2):79-82.
10. Prasad P, Bhat S. Clinicomicrobiological study of community-acquired pneumonia. Lung India. 2017;34:491-2.
11. Capoor MR, Nair D, Aggarwal P, Gupta B. Rapid diagnosis of community-acquired pneumonia using the BacT/Alert 3D system. Braz J Infect Dis. 2006;10:352-6.
12. Shah BA, Singh G, Naik MA, Dhobi GN. Bacteriological and clinical profile of Community acquired pneumonia in hospitalized patients. Lung India: Official Organ of Indian Chest Society. 2010;27(2):54-7.

Cite this article as: Lamb A, Patil AH. Management and outcome of community acquired pneumonia: hospital based study. Int J Res Med Sci 2018;6:2271-4.