

TREATMENT OUTCOME PROFILE OF NON RESOLVING PNEUMONIA AMONG HOSPITALIZED COMMUNITY ACQUIRED PNEUMONIA PATIENTS IN TERTIARY CARE CENTRE: AN OBSERVATIONAL STUDYRaveendra K. R¹, Ashok M. L², Jananee Muralidharan³**HOW TO CITE THIS ARTICLE:**

Raveendra K. R, Ashok M. L, Jananee Muralidharan. "Treatment Outcome Profile of Non Resolving Pneumonia among Hospitalized Community Acquired Pneumonia Patients in Tertiary Care Centre: An observational study". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 31, July 31; Page: 8608-8613, DOI: 10.14260/jemds/2014/3094

ABSTRACT: BACKGROUND: Most of the times, a Community Acquired Pneumonia (CAP) patient is being treated with empirical antibiotics by best guess method by the clinician. Patient who did not show expected clinical improvement or resolution on chest x- ray after 2 weeks of antibiotics is considered as unresolved or non-resolving pneumonia and is a major problem, contributing to increased mortality and morbidity in the medical wards. **AIM OF STUDY:** 1. To study the clinical profile of unresolved pneumonia among CAP. 2. To know the treatment outcome in these cases. **MATERIALS & METHODS:** 80 hospitalized CAP patients who did not improve either clinically or radiologically after 2 weeks of broad spectrum antibiotics were included in the study. Details of these patients including investigations done at other higher centers were recorded and patients were followed up for 6 months or till death. **RESULTS:** Unresolved pneumonia was commonly observed in patients more than 50 years. Pulmonary tuberculosis was the commonest cause, followed by MDR varieties of CAP, Bronchogenic carcinoma. Multiple risk factors were noted, which includes cigarette smoking, alcohol, COPD, Diabetes, HIV positive status. Elderly age, multiple risk factors, antibiotic abuse and resistance resulted in majority of the cases. **CONCLUSION:** This study highlights the importance of early recognition and appropriate treatment of CAP to prevent unresolved pneumonia and use of invasive and latest investigations to recognize unresolved pneumonia, to decrease mortality and morbidity.

KEYWORDS: Unresolved pneumonia, Non-resolving pneumonia, Antibiotic resistance, CAP.

INTRODUCTION: Pneumonia is a leading cause of death in the world and is the number one cause of death from infectious diseases in the united states¹ Normal resolution of pneumonia is not well defined. Typically patients feel symptomatic improvement within 3-5 days of initiation of antibiotic treatment.² Richard winterbaver et al has defined slowly resolving pneumonia in the immunocompetant patients as either less than 50% clearing at 2 weeks or less than complete clearance by 4 weeks on chest x-ray in a patient who has symptomatically improved with antibiotic therapy.³

Unresolved pneumonia may be defined as a patient of CAP who does not show clinical or radiological improvement despite antibiotic therapy for at least 2 weeks.⁴ Unresolved pneumonia is usually seen in 6-15% of hospitalized patients with CAP.⁵ Many factors are blamed for poor resolution in CAP patients. Presence of co-morbid conditions plays a vital role in the treatment outcome of CAP patients.

Different causes for non-resolving pneumonia include unusual organisms, antibiotic resistance, impaired host immune system, presence of multiple co-morbid conditions and onset of

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early complications of pneumonia and rarely misdiagnosis. Thus, non-resolving pneumonias are difficult to treat and carry poor prognosis if they are not investigated further and appropriate treatment not given in time.

MATERIALS AND METHODS: The study was designed as a prospective observational study, conducted at Victoria hospital, Bangalore, A major teaching hospital for Bangalore medical college and research institute. Patients admitted under Medicine department with the diagnosis of CAP, not showing adequate clinical or radiological improvement or worsened from baseline after 10-14 days of empirical antibiotics from 01-01-2012 to 31-12-2013 were screened for the study.

The total of 964 patients were admitted for CAP based on the clinical and radiological assessment and 98 patients showed poor clinical improvement or less than 50% radiological clearance. In those 80 patients - 48 males and 32 females were included for the study as the records of remaining patients (DAMA-7, referred to higher centre and later found untraceable-5, incomplete case sheets-6, total 18) were incomplete or inadequate.

All the admitted adult CAP patients a detailed history - present, past, family, personal including previous antibiotic usage were taken. All were investigated with baseline chest X- ray, blood, sputum and other relevant tests. All were started with broad spectrum antibiotics, empirically based on IDSA guidelines⁶ (changed later according to C/S reports).

Patient who did not improve clinically or worsened during the treatment were subjected to repeat chest X- ray in the second week of treatment and patient showing less than 50% resolution on chest X ray after receiving 10-14 days of antibiotics were included in the study and were investigated thoroughly- repeat sputum C/S, sputum AFB, mantoux test, sputum cytology, ELISA-HIV and in a few cases fungal studies, CT-scan, Bronchoscopy were advised. (Some patients were referred to higher centers for special investigations like fiberoptic bronchoscopy, BAL, FNAC/biopsy). 7 patients refused to undergo further tests and went against medical advice (DAMA) and 5 patients could not be traced after being referred to higher centers for special investigations.

RESULTS: A total of 80 patients were included in the study, males 48 and females 32, with a male to female ratio 3:2 (table 1). Commonly affected age group were between 51-60years (32/80), 41-50years (22/80) and 61-70years (14/80). Most common symptoms include fever 95%, cough 90%, breathlessness 90% and hemoptysis in 40% of patients. 40 patients reported worsening of symptoms after 10 days of antibiotics and the remaining 40 patients continued with the same symptoms without much improvement. Important co-morbid conditions include smoking 24, alcohol 16, diabetes 16, HIV positive status 8, COPD 9, anemia 9, hypertension in 8 patients.

One risk factor (co-morbid) was noticed in 14 patients, 2 in 20 patients, 3 in 12 and more than 3 risk factors in 8 patients (table 2). On chest x-ray unilateral lung cases were noted in 56 and bilateral in 24 patients. Commonest sites include right lower zone in 28, right upper zone in 16, left lower zone in 12, left upper zone in 6 and multilobar involvement in 14 patients. At admission 36 patients belonged to class 5, 28 for class 4, 12 for class 3 under PORT score classification.

On further workup for non-resolving pneumonia, appropriate investigations like fiberoptic bronchoscopy (19), CT chest (18), mantoux test (72), sputum C/S (for all), sputum AFB (for all), mycobacterial culture (24) were carried out. Most common causes were found to be definite (sputum positive or culture positive)/suspected (radiological evidence) PTB in 28 patients, malignancy 8, PCP

infection 8, lung abscess 6, bronchiectasis 6, empyema 2, and antibiotic resistance in 20 patients (table 3). Positive sputum cultures obtained in 24 patients and commonest organisms isolated were klebsiella in 10 patients, pseudomonas sp. 6, staph. aureus 4, E. coli 2, Acinetobacter in 2 patients. Blood culture positivity was obtained in 5 (5/30) patients and the common organism isolated was staph, aureus in 3 patients.

All CAP patients with resistance to empirical antibiotics responded favorably to the treatment after initiating specific antibiotics. All 10 definite TB patients and 12 suspected TB patients were started with ATT cat-1 under RNTCP. Complications like ARDS were noted in 10 patients, ARF in 6 patients, septicemia with MODS in 10 patients and 14 patients were treated in medical ICU and 4 patients required hemodialysis for a short period. About treatment outcome, good clinical and x-ray resolution was seen in 40 patients, partial resolution in 12, poor resolution in 6 and death noted in 16 patients. 6 patients were lost to follow up. There were 16 deaths noticed in the study which includes Bronchogenic carcinoma 4, septicemia with MODS 3, PCP 4, ARF 2, ARDS 2 and DKA 1.

DISCUSSION: Identifying the group of non-responders in the management of hospitalized CAP patients, based on the clinical and radiological parameters is an important phase and requires further evaluation for a proper diagnosis. Proper history (Including travel, occupation, co-morbid conditions, antibiotic usage, and exposure to PTB), clinical examination and baseline investigations will help to choose a proper antibiotic which is the main stay in the management of CAP. Out of 964 diagnosed and treated CAP patients in two years period.

98 patients satisfied the criteria for non-resolving pneumonia and 80 were selected for the present study with a male to female ratio of 3:2. 90% of patients were above 40 years. 80% of patients admitted belong to PORT staging of class 4 and class 5 satisfying the protocol treatment⁷. Co-morbid conditions were present in the majority of the patients. Smoking in 30%, alcohol abuse in 20% diabetes 20% hypertension 10% COPD 11.2%, HIV positive status in 10% and anemia in 11.2% were noted. Jay-S reported common conditions associated with delayed resolution are advanced age COPD and alcoholism.⁸

In the present study multiple risk factors/co-morbid conditions were noted in 35 (43.7%), (2 in 20, 3 in 12, more than 3 in 8) patients. The common age group reported for non-resolving pneumonia was between 50-70 years, contributing to 57.5% of patients, explaining the multiple factors like smoking, malnutrition, DM, and possible malignancies at that age.

In this study PTB was the commonest (28/80) cause of non-resolving pneumonia which includes sputum positive PTB in 12, culture positive PTB in 4, sputum negative PTB in 12. Most of the sputum negative PTB (10/12) were referred from peripheral centers as poor responders to one antibiotic and atypical Chest X-ray findings on follow-up. All responded to ATT supplied through RNTCP at the end of six months. Lung malignancy was noted in 8 patients (10%) in this study on par with the western literature.⁹

A diagnosis based on history, reported chest X-ray, HRCT and bronchoscopy at specialized institutes and oncology opinion taken. Carcinoma of the lung was suspected in elderly patients, chronic smokers, recurrent hemoptysis, chest x-ray findings-mass lesion, collapse consolidation, hilar lymphadenopathy and appearance of fresh lesions in repeat films.

Culture was positive in 30% of patients only, as many patients were exposed to antibiotic therapy before hospitalization. Multidrug resistance (resistance to more than 3 different group of

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antibiotics) was seen in 18.8% of patients and later these patients improved with appropriate (based on C/S report) and prolonged (14–21days) antibiotic treatment. 50% of patients responded with complete resolution on chest x-ray with proper antibiotics or cat-1 ATT and 18 patients clinically responded with partial or poor resolution on chest x-ray. 6% were lost to follow-up because of multiple co-morbid conditions and deterioration in general health.

16 deaths (20%) were noted in this study during the follow up of 6 months. The main causes are carcinoma lung in 4 patients, PCP 4, septicemia 3, ARDS 2 and DKA in 1 patient. Western literature shows a mortality of 27-49% in non-resolving pneumonia¹⁰. Four patients – those who opted out of study (DAMA) and those who lost to follow up also died of ongoing illness (according to information available from patient's relatives). Hence mortality increases automatically if we take these things into consideration.

CONCLUSION: The clinical spectrum, co-morbid conditions, bacterial flora and the antibiotic sensitivity pattern are fast changing in CAP patients. Advanced age, multi drug resistant state, multiple risk factors and immune suppression play a significant role in non-resolution of pneumonia. Apart from local causes like lung abscess, bronchiectasis, unrelieved obstruction, a strong suspicion of PTB in general and malignancy in particular is needed in all non-resolving pneumonias.

Since PTB and multidrug resistance forms large number of cases, early suspicion and conformation with appropriate treatment will help in complete resolution. This study stresses the importance of systematic approach to all unresolved pneumonias with proper invasive, sonological, microbiological investigations at appropriate time to arrive at a diagnosis and for a corrective treatment to prevent the ever increasing mortality and morbidity in CAP patients.

Distribution of patients Age & Gender(n=80)
Table -01

Age	Male	Female	Total
11-20	01	00	01 (1.25%)
21-30	02	01	03 (3.75%)
31-40	02	02	04 (5%)
41-50	16	06	22 (27.5%)
51-60	18	14	32 (40%)
61-70	05	09	14 (17.5%)
71-80	04	00	04 (5%)
Total	48	32	80

Risk Factors for Unresolved Pneumonia (n=80)
Table -02

Smoking	24	30 %
Alcohol	16	20%
Diabetes	16	20%
Hypertension	08	10%
COPD	09	11.2%
HIV	08	10%
Anemia	09	11.2

Etiology for Unresolved Pneumonia (n=80)
table- 03

Definite PTB	16	27.5%
Suspected PTB	12	15
Malignancy	08	10%
PCP	08	10%
Lung Abscess	06	7.5%
Bronchiectasis	06	7.5%
Empyema	02	2.5%
Antibiotic Resistance	20	25%
Others	02	2.5%

REFERENCES:

1. Lionel A. Mandell, Richard G. Wunderink, Antonio Anzueto, Cynthia G. Whitney et al. Infectious Diseases Society of America/ American Thoracic Society Consensus Guidelines on the Management of CAP in adults: CID 2007: 44 (Suppl 2).
2. Lehtomaki K. Clinical diagnosis of pneumococcal adenoviral mycoplasmal and mixed pneumonias in young men. Eur Respir J 1988; 1: 324-9.
3. Kirtland SH, Winterbauer RH. Slowly resolving chronic and recurrent Pneumonia. Clinical Chest Med: 1991; 12: 303-18.

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4. Kyprianou A, Hall C.S, Fein A.M. The challenge of non-resolving pneumonia. *Postgrad Med* 2003; 113: 79-82, 85-88, 91-92.
5. Menendez R, Torres A, Zalacain R et al. Risk factors of treatment failure in CAP; Implications for disease outcome; *Thorax* 2004; 59:960-5.
6. Mandell LA, Wunderink RG, Anzueto A, Barlett JC, Campbell GD, Dean NC et al. Infectious diseases society of American Thoracic Society Consensus Guidelines on the management of CAP in Adults; *Clinical Infectious Diseases*;2007; 44: 527-72.
7. Fine MJ, Auble TE, Yealy DM, Hanusa BH, Weissfeld LA, singer DE et al. A prediction rule to identify low risk patients with CAP. *N Engl J Med* 1997; 336: 243-250.
8. Metlay JP, Schulz, Li H et al. Influence of age on symptoms at presentation in patients with CAP in the community. *Arch Intern Med* 1997; 157: 1453-9.
9. Feinsilver SH, Fein AM, Niedeman MS, Schuttz DE, Fourgenberg DH. Utility of fiber optic bronchoscopy in non-resolving pneumonia. *Chest* 1990; 98: 1322-6.
10. Aranciba F, Ewig S, Martinez JA, Ruiz M, Bauer T, Marcos MA et al. Antimicrobial treatment failures in patients with CAP; cases and prognostic implications. *Am J RespirCrit Care Med* 2000; 162: 154-60.

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