Summer 8-8-2017

Clinical Profile and Outcome in Patients with Community Acquired Pneumonia

Hardik Pipalia

ABSTRACT

"CLINICAL PROFILE AND OUTCOME IN PATIENTS WITH COMMUNITY ACQUIRED PNEUMONIA."

By

Dr. Hardik Manubhai Pipalia

Introduction - Community-acquired pneumonia (CAP) is one of the most common infectious diseases addressed by clinicians and is an important cause of mortality and morbidity worldwide. Pneumonia is one of the leading causes of death and morbidity, both in developing and developed countries and is the commonest cause (10%) of hospitalization in adult and children. Estimates of the incidence of community-acquired pneumonia range from 4 million to 5 million cases per year, with about 25% requiring hospitalization. Community-acquired pneumonia refers to pneumonia acquired outside of hospitals or extended-care facilities. The objective of the project to study etiological profile, clinical and radiological profile and hospital outcome, the applicability of PSI score for the outcome, the outcome related to age, gender, and risk factors in patients with CAP.

Method – The data was primarily collected in the department of medicine who were diagnosed as community acquired pneumonia at GCS medical college, Ahmedabad, India during 2014 to 2015. It is a retrospective clinical observational study which includes 50 adult patients with CAP at admission to the hospital. Detailed relevant history and clinical examination were done according to predesign and pre-tested format. The patients were classified according to PSI score classification. The collected data was analyzed and compared with previous studies on same/similar topics. Statistical analysis like chi square

test, mean, standard deviation of the mean, and Fischer exact test were done.

Result – In this study, 48% patients were with bacteriological pneumonia, and 38% were H1N1 pneumonia. Among those patients, risk factors for CAP like upper respiratory tract infection (24%), Lung pathology (14%), Smoking (24%), and Diabetes mellitus (14%) were present and statistically significant($p<0.05$). Also, a radiological profile like lobar pneumonia was most common in bacterial pneumonia (75%), and bronchopneumonia was most common in H1N1 pneumonia (52.6%) which found statistically significant ($p<0.05$) in the research study. In this study, death had occurred in 8.33% bacterial pneumonia, and 36.8% H1N1 pneumonia which was statistically significant as p value is <0.05 by chi square test. In the present study, 50% patients in PSI class IV and class V died which was statistically significant ($p<0.05$), 100% patients of class V and 87.5% patients of class IV developed complications, and most common complication was respiratory failure (47.3%) in H1N1 pneumonia, and most common complication was pleural effusion (20.8%) in bacterial pneumonia.

Conclusion – In present study, H1N1 is most common pathogen (38%) in CAP followed by Streptococcus pneumonia (28%) and death due to CAP was higher in H1N1(36.8%) in compare to bacterial cause (8.33%) because this study's data was taken in September 2014 to September 2015 which was the time of H1N1 epidemic in that region of India. In the present study, most common chest x ray finding was patchy consolidation followed by left lower zone involvement and right lower zone involvement. PSI (pneumonia severity index) score is used for determination of hospital admission and assess 30-days mortality. Clinical trials demonstrate that routine use of the PSI score results in lower admission rates for a class I and class II patients. Patients in class III could ideally be admitted to an observation

unit until a further decision can be made. In the present study, mortality was 50% in class IV and class V patients.

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A Thesis Submitted to the Graduate Faculty

of Georgia State University in Partial Fulfillment

of the

Requirements for the Degree

MASTER OF PUBLIC HEALTH

ATLANTA, GEORGIA

30303

APPROVAL PAGE

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Author's Statement Page

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CHAPTER 1
INTRODUCTION

Background

Pneumonia is a disease known to humanity from antiquity. Pneumonia is an acute inflammation of the pulmonary parenchyma that can be caused by various infective and noninfective origins, presenting with physical and radiological features compatible with the pulmonary consolidation of a part or parts of one or both lungs (Seaton, Seaton, Leitch, & Crofton, 2000).

Pneumonia signifies a pulmonary inflammatory process. The most significant and striking feature of which is consolidation (Kasper et al., 2005). Community acquired pneumonia is an acute illness acquired in the community with symptoms suggestive of LRTI. Together with the presence of a chest radiograph of intra-pulmonary shadowing which is likely to be new and has no clear alternative cause (Seaton, Seaton, Leitch, & Crofton, 2000). Pneumonia is one of the leading causes of death and morbidity, both in developing and developed countries and is the commonest cause (10%) of hospitalization in adult and children (Hall et al., 20011).

Increasingly newer microbiological agents some of which are well known and some are very new pathogens has revolutionized the understanding of pneumonia, and this led to the extensive use of modern antibiotics (J. Bartlett, 2000). In the late twentieth and twenty-first century, newer microbial agents have emerged like - opportunistic lung infection in patients with HIV infection and post organ transplant patients (J. Bartlett, 2000). All these have led to the need for an understanding of the immunological status of the individual. With the beginning of an antibiotic era, the mortality rate leveled off and remained constant. This mortality rate is heavily weighted against elderly. This predilection of pneumonia for elderly is not new and led William Osler in 1898 to

describe as ‘friend of the aged' J. (G. Bartlett et al., 2000). The actual incidence of pneumonia acquired in the community is unknown and undoubtedly primary care physicians treat many pneumonia episodes as ‘lower respiratory tract infection’ or ‘bronchiolitis’ without recourse to chest radiographs (Stocks, Turnidge, & Crockett, 2004).

Gap and Purpose of the study

Previously, H1N1 pandemic 2009 and post pandemic 2014 has led to a massive interest in H1N1 pneumonia. However clinical profile and outcome in CAP from varied etiology in a various group of patients remain under documented and requires comprehensive study. Several prospective studies have shown that risk factors for community acquired pneumonia are COPD, diabetes mellitus, renal insufficiency, congestive cardiac failure, coronary artery disease, malignancy, chronic neurologic disease, chronic liver disease, alcoholism, and smoking (Shah, Giudice, Griesback, Morley, & Vasoya, 2004). There is a lack of scientific research in our population about PSI score as the prognostic score for outcome in CAP. This study attempts to use PSI score as prognostic markers for in hospital outcome in CAP. The purpose of undertaking this study is to study clinical profile, complication, and outcome in CAP of varied etiology.

AIMS AND OBJECTIVES

- To study Etiological profile in CAP
- To Study of clinical profile, radiological profile, in hospital outcome in CAP of different etiology.
- To study the outcome of CAP patients related to age and gender.
- To study the applicability of PSI score for in hospital outcome in CAP.

CHAPTER 2

REVIEW OF LITERATURE

Epidemiology of CAP

John G. Barlett and Linda M. Mundy studied that, "the elderly patients who constitute the adult population group with highest attack rate for CAP & the group with the highest mortality due to disease" (J. Bartlett, 2000). M. J. Fine and others concluded their study that, "the mortality for patients hospitalized with CAP was high and was associated with characteristics of the cohort, pneumonia etiology, and a variety of prognostic factors" (M. J. Fine et al., 1996, 1997). According to the Bartlett JG et all, "In the United States, approximately 4 million cases of pneumonia occur each year, accounting for 10 million physician visits, approximately 500,000 hospitalizations, and approximately 45,000 deaths" (Bartlett, Breiman, Mandell, & File, 1998). While the mortality has ranged from 2% to 30% among hospitalized patients, the average rate is approximately 14% (Bartlett et al., 1998). According to Mandell LL, "Mortality is estimated to be less than 1% for patients who are not hospitalized. The total estimated cost of treating CAP is $23 billion, with indirect costs (e.g., absence from work) accounting for a significant percentage of this amount" (Mandell, 1995). For persons between the ages of 5-60 years, various studies have reported the incidence of CAP between 100-500 per 100,000 population (Mandell, 1995). According to Houston MS, et al., "CAP occurs more commonly in children younger than the age of 5 years and adults older than the age of 65 years. In 1987, Houston and colleagues retrospectively evaluated the incidence of pneumonia (nursing home and community-associated) in elderly residents (> 65 years of age) in Homestead County, Minneapolis, MN" (Millett, Quint, Smeeth, Daniel, & Thomas, 2013).

Summary of Literature Review

This review discusses the predisposing factors, causative pathogens, pathogenesis, etiology, as well as the diagnostic studies and antimicrobial management of this important infection.

Dey at al shown that the presence of certain factors in addition to old age like h/o smoking presence of COPD, late presentation to hospital, systolic & diastolic hypotension, high blood urea, low serum albumin and development of septic shock was associated with higher incidence of complications and a poorer prognosis (Dey, Nagarkar, & Kumar, 1997).

Marrie and her team recently summarized the findings from nine such studies that streptococcus pneumoniae was the most common pathogen, accounting for 9% to 55% of cases in the various studies or 18% of the pooled data from all studies and streptococcus pneumoniae remains the most important pathogen; however, emerging resistance of the organism to antimicrobial agents has affected empirical treatment of CAP (Mandell, Marrie, Grossman, Chow, & Hyland, 2000). Diagnostic evaluation of CAP is essential for the appropriate assessment of severity of illness and establishment of the causative agent of the disease (Garibaldi, 1985). According to Michael J. Fine et al., they found a prediction rule to identify low-risk patients with community-acquired pneumonia. This prediction rule may help physicians to make more rational decisions about hospitalization with pneumonia (Michael J. Fine et al., 1997). According to T. Franquet, has shown that when an infectious pulmonary process is suspected, knowledge of varied radiographic manifestations will narrow the differential diagnosis, helping to direct additional diagnostic measures, and serving an ideal tool for follow up examination (Franquet, 2001). Joshua P. Metlay, Michael J. Fine have reviewed the test characteristics of the history, physical examination, and laboratory findings, individually and in combination in the diagnosis Of CAP and predicted the short-term risk of death from the infection and shown that the absence of vital sign abnormalities substantially reduces the possibility of the infection (Joshua P. Metlay & Fine, 2003). Jose Vilar and others revealed in their study that the role of the radiologist is to be decisive in their diagnosis and

follow up. The CXR remains a basic tool for this purpose (Vilar, Domingo, Soto, & Cogollos, 2004). Sanraj K. Basi and others have studied that 1/3rd of patients suspected having pneumonia and is admitted to hospital did not have pneumonia, but had serious LRTI with substantial rates of bacteremia and mortality. The absence of radiographic findings should not supersede clinical judgment and empiric treatments in these patients (Basi, Marrie, Huang, & Majumdar, 2004). J. P. Metlay and others concluded in their study that respiratory, and non-respiratory symptoms are less commonly reported by older patients with pneumonia even after the control, increased comorbidity, and illness severity in these older patients (J. P. Metlay, Schulz, et al., 1997). Larry G. Reimer and Karen C. Carrol found that 'maximum benefit from currently available tests can be derived by their use in patients with clear clinical and radiographic evidence of pneumonia' (Reimer & Carroll, 1998).

Robert E. Siege and others have concluded in their study that adult patients hospitalized for CAP who are not severely ill can be successfully treated with an abbreviated (2 day) course of iv antibiotics and then switched over to oral therapy (Siegel et al., 1996). A longer course of iv therapy prolongs hospital stay and cost, without improving the therapeutic cure rate (Siegel et al., 1996). Roger G. et al. studied that 'CAP' is a common condition, which has a significant mortality. The management is centered around assessment and correction of gas exchange and fluid balance together with administration of appropriate antibiotics' (Roger et al.,1998). Thomas M. File Jr. reviewed important features and management issues of CAP that were particularly relevant to immunocompetent adults considering new information about the cause, clinical course, diagnostic testing, treatment, and prevention (File, 2003).

Thomas P. et al. studied that pneumonia is a frequent cause of hospitalization and death among elderly patients, but the relationship between processes of care for pneumonia and outcomes are uncertain, making quality improvement a challenge (Meehan, Fine, Krumholz, & et al., 1997).

CHAPTER 3
Introduction

HISTORICAL REVIEW

Community acquired pneumonia has been recognized as a common and potentially lethal condition for nearly two centuries. The term pneumonia (peri pneumonia) was first introduced by Hippocrates in fourth century BC at that time treatment included leeches, couplings, and shapes applied to the chest wall together with emetics, tonics, and purges to the inflammation away from the chest. Vigorous bloodletting was also popular, particularly in Great Britain. The erroneous concepts of anatomy and physiology of lung, which prevailed up to last century, hampered the real understanding of pneumonia although it was regarded as some inflammation of the lung. Celsus and others accurately described the condition.

Morgagni (1682-1717) identified the clinical features of pneumonia- solidification of lungs. Gallon Carl Rokintasky (1804-1875) was first to differentiate between lobar pneumonia and bronchopneumonia. William Wood Gerhard (1809-1872) wrote interesting papers on smallpox and pneumonia in children. In 1834 Laennec paved the way for a modern understanding of lobar pneumonia by describing the three stages of consolidation, pathologically. PITIUS RATTLE (CRACKLES) as a pathognomonic sign of the first stage of pneumonia., and is still considered. William Macullum (1874) demonstrated pathological features of pneumonia. In 1879, a Swiss Physician described seven causes of atypical pneumonia after contact with tropical birds. In 1881, Pasteur and Sternberg demonstrated pneumococcus from normal saliva. Towards the end of nineteenth-century causes of pneumonia became a matter of hot debate. Friedlander (1881-1884) first found bacteria in the lungs of fatal causes of pneumonia, using staining technologies perfected by his colleague gram and isolated an organism called pnemoneikrococcus (Friedlander's bacilli) from 30-year-old

man died of pneumonia.

Several years later, Frinkel and others identified serological types of pneumonia, which eventually led to serum therapy. With the discovery of penicillin (1951) and other antibiotics, the solution to pneumonia was apparently sought, and interest in pneumonia waned. Then it was found that there were 'atypical pneumonia,' which is less severe and did not respond to penicillin therapy (e.g. Mycoplasma pneumonia-eaton agent, Coxiella Burnetti-Q fever, chlamydia psittacocci-psittacosis). Later in 1957 by the immunofluorescent technique, they demonstrated a species of mycoplasma in the bronchial epithelium. Next major event in the history of pneumonia was the outbreak of legionnaires disease in Philadelphia in 1976. With many advances in the discovery of microbiological etiology of pneumonia, and modern antibiotics have revolutionized the understanding and treatment of pneumonia. In late 20th century, newer microbiological agents (opportunistic infections) in immunosuppressed patients have been increasingly recognized, and this led to the need for an understanding of the immunological status of the individual with pneumonia.

The most recent event occurred in 1986, does chlamydia pneumonia cause pneumonia. This species is different from psittacosis. Although the bacteriological diagnosis and immunological status of the individual have explained the pathophysiology of pneumonia, the radiological recognition continues to be the most valuable investigative tool for the diagnosis of pneumonia. The radiological type of pneumonia does give a major clue regarding etiology and clinical outcome of pneumonia. Hence this attempt, to define and establish completely the clinical, bacteriological, and radiological profile of pneumonia acquired in the community admitted in our hospitals.

Community Acquired Pneumonia (CAP)

CAP is a common condition, which is caused by a variety of microbial pathogens with differing antibiotic sensitivities. It presents as a spectrum of disease ranging from a simple febrile

respiratory infection to a severe and fulminating illness leading to death (Finch & Woodhead, 1998). An acute illness acquired in the community with symptoms suggestive of a lower respiratory tract infection like Fever, cough, sputum-which may be purulent, chest pain, dyspnea together with the presence on a chest radiograph of intrapulmonary shadowing which is likely to be new and has no clear alternative cause like Lung cancer, pulmonary edema (Niederman et al., 2001).

Definition of CAP

A syndrome resulting from acute infection, usually bacterial, characterized by clinical and radiographic signs of consolidation of a part or parts of one lung or both lungs (Niederman et al., 2001).

Mode of transmission

Pathogens may enter the lung by following routes like Aspiration of organisms that colonize the oropharynx, Inhalation of infectious aerosols, Hematogenous dissemination from an extrapulmonary site, Direct inoculation and contiguous (adjoining) spread (Finch & Woodhead, 1998).

Pathology

The pneumonic process may involve the interstitial or alveoli primarily. The involvement of an entire lobe is called-lobar pneumonia (Carroll, 2002). When the process is restricted to alveoli adjoining to bronchi is called-bronchopneumonia (Carroll, 2002). Cavities develop when necrotized lung tissue is discharged into communicating airways (Carroll, 2002). Pathogenesis of pneumonia due to various microorganisms is same, but few differences or changes can be seen either in pathology or subsequent complication(Carroll, 2002). According to Carroll and team, following is the pathological staging for lung:

Pathological staging

- Stage of congestion-fine crackles (INDUX CREPITUS)
- Stage of red hepatisation-tubular bronchial breathing

- Stage of grey-hepatisation- tubular bronchial breathing
- Stage of resolution-coarse crackles (REDUX CREPITUS)

The gross anatomic alteration may follow from the microscopic changes mentioned. Lobar pneumonia may involve one lobe or several lobes, bilateral or unilateral (J. G. Bartlett et al., 2000). Widespread involvement of all lobes is not common for the fact that the life can rarely be sustained with such total impairment of lung function (J. G. Bartlett et al., 2000). Clinically one entire lobe is involved, and inflammation is sharply limited to it by inter lobar fissure (J. G. Bartlett et al., 2000). Pneumonia is predisposed by any condition that reduces or suppresses a cough, impairs mucociliary activity, reduces the effective phagocytic activity of alveolar macrophages and neutrophils, impairs immunoglobulin production (Bhatty, Pruett, Swiatlo, & Nanduri, 2011).

Etiology

According to Macfartane et al., Microbial pathogens that cause Community acquired pneumonia is following: (Macfarlane, Ward, Finch, & Macrae, 1982)

A. Infective cause

Bacterial agents

- Pneumococcal Pneumoniae
- Staphylococcal Pneumoniae
- Klebsiella Pneumoniae
- Pseudomonas Pneumoniae
- Escherichia Pneumoniae
- Haemophilus Influenzae Pneumoniae
- Moraxella Catarrhalis Pneumoniae
- Legionella Pneumoniae
- Mycoplasma Pneumoniae
- Chlamydia Pneumoniae

Viral agents

- Influenza, Cytomegalovirus
- Respiratory Synctial Virus
- Measles
- Hanta Virus

Other agents - Histoplasma, Coccidiodes, Blastomycoces, Parasitic Pneumonia

B. Non-Infective Cause - Lipid Physical Pneumonia, Radiation Pneumonia

Classification of pneumonia

According to Barlett et al., There are different classification based on studies which described below

(Barlett, Boitano, & Barman, 2010)

1. Morbid anatomist's classification

1.Lobar pneumonia

2.Segmental pneumonia

3.Sub segmental pneumonia

4.Bronchopneumonia

2. Empiricist's classification

1. Community acquired pneumonia
2. Hospital acquired pneumonia
3. Aspiration pneumonia
4. Immunocompromised pneumonia-aids related

3. Microbiologist's classification

1. Bacterial
2. Viral
3. Bacteria like and rickettsia like pneumonia
4. Fungal

5. Parasitic pneumonia
6. Chemical pneumonia
7. Physical pneumonia-ionizing pneumonia

4. Behaviorist's classification

1. Easy pneumonia
2. Difficult pneumonia

The widely accepted classification of pneumonia is based on causative organism rather than anatomic characteristics. There are many conditions, which can mimic non-resolving pneumonia. They are Hypersensitivity pneumonitis, Drug induced pneumonitis, Sarcoidosis, Systemic necrotizing vasculitis, Wagener's granulomatosis, Pulmonary alveolar prognosis, Neoplastic disorder, and Pulmonary embolism (Black, 2016). When a lung lesion diagnosed as pneumonia and fails to respond to therapy or the resolution is inappropriately slow (failure of chest x-ray to clear within four weeks, then the term non- resolving pneumonia come to play (Black, 2016). The presence of co- morbid conditions such as CCF, systemic immunologic diseases, challenges the physician to speculate whether these host factors are delaying resolution or to reconsider the diagnosis of pneumonia. Furthermore, the severity of pneumonia and responsible pathogen may contribute to the overall time required for complete resolution (Finch & Woodhead, 1998). Fein and Fein silver have defined pneumonia to be non-resolving when a radiographic infiltrate has failed to resolve in appropriate time course for the presumptive diagnosis after at least ten days of antibiotic therapy. Kirtland and wlinterbaver described slowly resolving pneumonia as less than 50% clearing of radiographic infiltrates at two weeks or less than complete clearing at four weeks in an immunocompetent patient who has improved symptomatically.

Clinical manifestations

According to Sanraj Basi et al., CAP traditionally presents in two forms (Basi, Marrie, Huang, & Majumdar, 2004):

Typical - The typical pneumonia syndrome is characterized by sudden onset of fever with or without chills, cough productive of purulent sputum, shortness of breath, pleuritic chest pain, haemoptysis, and signs of pulmonary consolidation like dullness, increased vf/vr, egophony, bronchial breath sounds and rales may be found on physical examination in chest x-ray. Most common pathogen in CAP is Streptococcus Pneumoniae, but can also be due to H. influenzae and mixed anaerobic and aerobic components of oral flora (Basi, Marrie, Huang, & Majumdar, 2004).

Atypical - The atypical pneumonia is characterized by gradual onset of fever, dry cough, shortness of breath, a prominence of extrapulmonary symptoms-headache, myalgia, fatigue, sore throat, nausea, vomiting, and diarrhea, with minimal signs on chest x-ray. Atypical pneumonia is classically produced by M. pneumoniae, can also be caused by chlamydia pneumoniae, oral anaerobes, and Pneumocystis carinii and less frequently encountered pathogens ch.psittaci, Coxiella burnetii, Francisella tularensis, H. capsulatum, Coccidioides immitis, and certain viruses also produce atypical pneumonia (Basi, Marrie, Huang, & Majumdar, 2004).

Non-respiratory symptoms of cap include lower lobe pneumonia may present with abdominal pain, rigidity, ileus, marked confusion seen in patients with severe pneumonia, may present with signs of meningitis, cerebellar dysfunction, evidence of hypoxia, and metabolic disturbances (Basi, Marrie, Huang, & Majumdar, 2004).

Diagnosis

The patient's living circumstances, occupation, travel history, animal exposure history and contact with patients will provide a clue to the microbial etiology of pneumonia (Joshua P. Metlay & Fine, 2003).

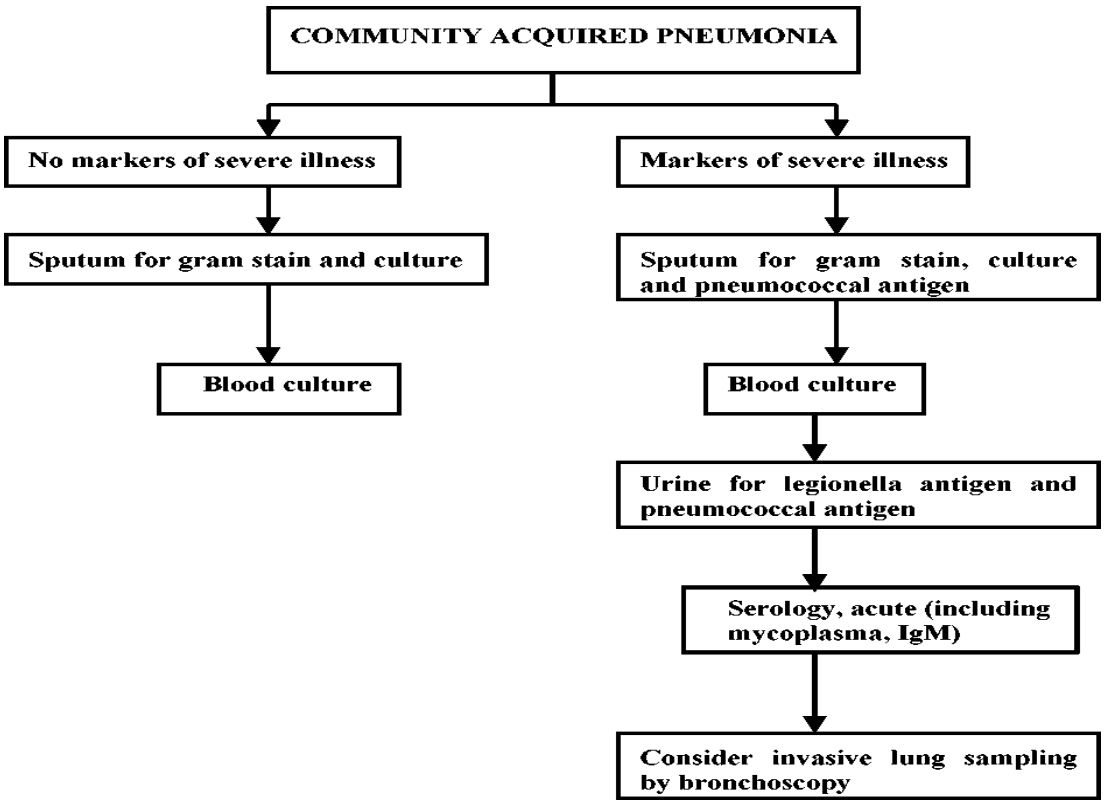
According to Joshua et al., Investigation required is following:

A. Non-specific- Urine routine, Complete hemogram, Serologic studies-ELISA for HIV-1 and HIV-2, Cardiac evaluation-ECG, Blood gas analysis, and Blood culture.

B. Specific

1. **Non-invasive -** CXR**,** Sputum examination – AFB and Gram stain**,** Sputum culture
2. **Invasive –** Bronchoscopy, Lung biopsy, and Pleural fluid examination

Microbiological investigation of patients admitted to the hospital with community acquired pneumonia following flowchart (Woodhead, 1991)



Treatment

CAP can be treated as Outpatient or In-Patient depending on the severity of CAP. An empirical orally administered antimicrobial approach for mild pneumonia treated in CAP is below described according to its category (Michael J. Fine et al., 1997).

Outpatients

1. Previously healthy and no antibiotics in past 3 months
   - A macrolide (clarithromycin [500 mg PO bid] or azithromycin [500 mg PO once, then 250 mg qd]) *or*
   - Doxycycline (100 mg PO bid)
2. Comorbidities or antibiotics in past 3 months: select an alternative from a different class
   - A respiratory fluoroquinolone (moxifloxacin [400 mg PO qd], gemifloxacin [320 mg PO qd], levofloxacin [750 mg PO qd]) *or*
   - A β-lactam (preferred: high-dose amoxicillin [1 g tid] or amoxicillin/clavulanate [2 g bid]; alternatives: ceftriaxone [1–2 g IV qd], cefpodoxime [200 mg PO bid], cefuroxime [500 mg PO bid]) *plus* a macrolide[a]
3. In regions with a high rate of "high-level" pneumococcal macrolide resistance,[b] consider alternatives listed above for patients with comorbidities.

Inpatients, Non-ICU

- A respiratory fluoroquinolone (e.g., moxifloxacin [400 mg PO or IV qd] or levofloxacin [750 mg PO or IV qd])
- A β-lactam[c] (e.g., ceftriaxone [1–2 g IV qd], ampicillin [1–2 g IV q4–6h], cefotaxime [1–2 g IV q8h], ertapenem [1 g IV qd]) *plus* a macrolide[d] (e.g., oral clarithromycin or azithromycin [as listed above] or IV azithromycin [1 g once, then 500 mg qd])

Inpatients, ICU

- A β-lactam[e] (e.g., ceftriaxone [2 g IV qd], ampicillin-sulbactam [2 g IV q8h], or cefotaxime [1–2 g IV q8h]) *plus* either azithromycin or a fluoroquinolone (as listed above for inpatients, non-ICU)

Special Concerns

If Pseudomonas is a consideration:

- An antipseudomonal β-lactam (e.g., piperacillin/tazobactam [4.5 g IV q6h], cefepime [1–2 g IV q12h], imipenem [500 mg IV q6h], meropenem [1 g IV q8h]) *plus* either ciprofloxacin (400 mg IV q12h) or levofloxacin (750 mg IV qd)
- The above β-lactams *plus* an aminoglycoside (amikacin [15 mg/kg qd] or tobramycin [1.7 mg/kg qd]) *plus* azithromycin
- The above β-lactams[f] *plus* an aminoglycoside *plus* an antipneumococcal fluoroquinolone

If CA-MRSA is a consideration:

- Add linezolid (600 mg IV q12h) or vancomycin (15 mg/kg q12h initially, with adjusted doses)

Supportive treatment

The supportive treatment in CAP includes respiratory support given to the patients who are in obvious respiratory distress with tachypnea and at a risk of dying due to hypoxia and in need of close monitoring (Mandell, Marrie, Grossman, Chow, & Hyland, 2000). A PaO_2

of 6.7 kpa (50 mmHg) or less in the presence of a rising pco2 and acidosis are clear indications that mechanical ventilation may be necessary. Also, Fluid and electrolyte replacement gave to the patients with severe pneumonia because they may become dehydrated and because of that their depleted intravascular volume requires parenteral replacement (Mandell, Marrie, Grossman, Chow, & Hyland, 2000). Total parenteral nutrition is best instituted early in cases of pneumonia in whom mechanical ventilation is likely to be prolonged. Another consideration like the pleuritic pain is usually easily relieved by giving simple non-sedative analgesics. Also, Physiotherapy may assist expectoration of sputum in less ill patients (Mandell, Marrie, Grossman, Chow, & Hyland, 2000).

Complications

According to Mbata and his research team mentioned in their article, following are the complications of CAP (Mbata, 2013)

Local	**General**
Delayed resolution and lung organization	Skin rashes
Spread to other lobes	Meningitis, peritonitis, septic
Lung-abscess - common in Klebsiellosis	Arthritis
Respiratory failure	Gastroenteritis
Pleural effusion, empyema, pneumothorax	Hemolytic anemia, thrombocytopenia
Circulatory failure - Pericarditis, myocarditis	

Factors associated with high mortality and requiring hospitalization

Many researchers found out that adverse prognostic indicators are old age, tachypnoea (RR>30/min), hypotension (diastolic<60 mm hg), extensive involvement (>one lobe), atrial

fibrillation, initial normal leukocyte count, persistent leukocytosis (> 20,000/pl), leucopenia (<500/pl), and Hypoxemia help to check the severity of CAP (Michael J. Fine et al., 1997). Following are the factors associated with high mortality and requiring hospitalization (Michael J. Fine et al., 1997):

Clinical	Laboratory
Age> 60 years	TC < 4000 or > 20,000/cumm
RR > 30/min	Lymphocytes < 1000/cumm
HR>140/min	Urine output < 20 ml/day
BP < 90/60 mmHg	Chest x-ray biliary involvement
Altered sensorium	PaO_2< 60mmHg
Immunocompromised state	Bacteremia

Differential diagnosis

There are many differential diagnoses like Pulmonary tuberculosis, Bronchiectasis, Lung abscess, Liver abscess, and Hospital acquired pneumonia. Many studies concluded differences like the route of infection, the infective organism, the mode of infection, the rate of mortality, and the prevention modalities between CAP and Hospital acquired pneumonia (Niederman, McCombs, Unger, Kumar, & Popovian, 1998).

Pneumonia severity index

According to Fine et al., "PSI is important prognostic factors in patients who are admitted to the hospital. The pneumonia severity index (PSI) or PORT Score is a clinical prediction rule that medical practitioners can use to calculate the probability of morbidity and mortality among patients with community acquired pneumonia" (Fine et al., 1997). Community-acquired pneumonia (CAP) is well known to be one of the leading causes of morbidity and mortality with a significant financial burden (Marston et al., 1997). To manage the challenges of maintaining care quality while

limiting treatment costs, many investigators have turned to the development of prognostic scores (Ewig et al., 1998). The most widely accepted is the pneumonia severity index (PSI) developed by Fine et al. (4), which uses a combination of age and clinical, laboratory and radiographic features to estimate the mortality for an episode of CAP (Fine et al., 1997). Following is the PSI table and use most of the time to diagnose the severity of CAP (Fine et al., 1997):

Step 1: Stratify to Risk Class I vs. Risk Classes II-V	
Presence of:	
Over 50 years of age	Yes/No
Altered mental status	Yes/No
Pulse ≥125/minute	Yes/No
Respiratory rate >30/minute	Yes/No
Systolic blood pressure <90 mm Hg	Yes/No
Temperature <35°C or ≥40°C	Yes/No
History of:	
Neoplastic disease	Yes/No
Congestive heart failure	Yes/No
Cerebrovascular disease	Yes/No
Renal disease	Yes/No
Liver disease	Yes/No
If any "Yes," then proceed to Step 2	
If all "No" then assign to **Risk Class I**	
Step 2: Stratify to Risk Class II vs. III vs. IV vs. V	
Demographics	**Points Assigned**
If Male	+Age (yr)
If Female	+Age (yr) – 10
Nursing home resident	+10
Comorbidity	
Neoplastic disease	+30

Liver disease	+20
Congestive heart failure	+10
Cerebrovascular disease	+10
Renal disease	+10
Physical Exam Findings	
Altered mental status	+20
Pulse ≥125/minute	+10
Respiratory rate >30/minute	+20
Systolic blood pressure <90 mm Hg	+20
Temperature <35°C or ≥40°C	+15
Lab and Radiographic Findings	
Arterial pH <7.35	+30
Blood urea nitrogen ≥30 mg/dl (9 mmol/liter)	+20
Sodium <130 mmol/liter	+20
Glucose ≥250 mg/dl (14 mmol/liter)	+10
Hematocrit <30%	+10
Partial pressure of arterial O2 <60mmHg	+10
Pleural effusion	+10
∑ <70 = **Risk Class II**	
∑ 71-90 = **Risk Class III**	
∑ 91-130 = **Risk Class IV**	
∑ >130 = **Risk Class V**	

MATERIALS AND METHODS

Study type: Retrospective clinical observational study

Study Period: September 2014 to September 2015

Source of data: Adult patients admitted to Department of Medicine who were diagnosed as community acquired pneumonia at admission.

Sample size: 50 patients

Inclusion Criteria:

- Age>12 years
- Clinical symptoms like fever, cough with or without expectoration, pleuritic chest pain, dyspnea and altered sensorium.
- Clinical Signs like tachypnea, reduced chest movements, dull percussion note, bronchial breath sounds, increased vocal fremitus and vocal resonance and crepitation.
- Radiological evidence of pneumonia without any clinical evidence of pneumonia will also be included

Exclusion criteria:

- Hospital acquired pneumonia
- Lung malignancy
- Aspiration pneumonia
- Pregnancy
- PLWHA, neutropenic patients

The method of Study: This is secondary data which was primarily collected in one of the hospitals in India. During the study period, all patients presenting with and fulfilling the inclusion criteria were included in this study. Detailed relevant history and clinical examination were done according to predesigned and pretested format (Annexure-1). All the patients were subjected to routine investigations like Complete blood count with ESR, Routine biochemistry (RBS, RFT, LFT, Electrolyte), Sputum for Gram stain, AFB, Sputum culture, Urine routine and microscopy, HIV, Chest X ray, Ultrasonography of Chest and

Abdomen, and HbA1c. Also, other investigation as necessary such as H1N1, Pneumopanel, Arterial blood gas analysis, and Blood culture.

The diagnosis is made in each of these cases was noted down. The patients were classified according to PSI score classification. The patients were given a different group of antibiotics according to their general condition and had given supportive treatment according to their investigation. The primary outcome was defined as death. The secondary outcome was identified as O2 support, NIMV/IMV, Complication, Absence from work $\leq$ 10 days, and Absence from work > 10 days.

The collected data was analyzed and compared with previous studies on same/similar topics. Statistical analysis wherever appropriate was applied. For the statistical analysis, tests like Chi Square test, Mean, Standard Deviation of Mean, Fischer Exact test, and Odds Ratio were used.

OBSERVATIONS AND RESULTS

In the present study, 50 patients of community acquired pneumonia were examined with an objective to study etiological profile, clinical and radiological profile and hospital outcome, the applicability of PSI score for the outcome, the outcome related to age, gender, and risk factors. In this study, the incidence of CAP was more common in female (56%) as compared to male (44%).The table 1 shows that the highest incidence of CAP was found in the age group 41-50 years (30%) followed by 51-60 years (18%) then followed by 31-40 years. The Table 1 shows that age of 32 patients was below 50 years and age of 18 patients was above 50 years that was not statistically significant as p value is >0.05. In table 2, 34% patients have come under PSI class I, 28% patients have come under PSI class II, 18%

patients have come under PSI class III, 16% patients have come under PSI class IV, 4% patients have come under PSI class V. The table 3 shows that fever (94%) was the most common symptom followed by a cough (84%), and hemoptysis (6%) was the least common complaint by the participants. The table 3 shows that in young patients (age is <50 years) cough (87.5%) was the most common clinical feature followed by fever (78.1%) and breathlessness (71.8%) and among old patients (age is >50 years) fever (100%) was most common clinical features followed by a cough (77.7%) and breathlessness (72.2%).

The table 4 shows that in male patients smoking (54%) was the most common risk factor and in female patients preceding URTI (28.5%) was the most common risk factor. Table 5 shows radiological findings in patients having different risk factors. In the present study, lobar pneumonia was the most common in the patients having predisposing lung pathology (85.7%), and bronchopneumonia was most common in diabetic patients (71.4%). There was no statistical significance between risk factors (URTI, Smoker) for CAP and radiological findings as p value is >0.05 as per chi square test. The table 6 shows that bacterial pneumonia was occurred most commonly in patients having a risk factor of smoking (83.4%), preceding lung pathology (85.7%), alcohol (80%) and for H1N1 pneumonia, the most common risk factor was URTI (66.6%) followed by GERD (40%). Chi square test was used for table 6 for URTI, DM, Lung pathology, and Smoking which shows there was statistical significance as p value is <0.05.

The table 7 shows that 48% patients had bacteriological pneumonia, 38% patients had H1N1 pneumonia, 4% patients have fungal pneumonia. The table 7a shows bacterial pneumonia was more common in age $\leq$ 50 years (66.6%) and H1N1 pneumonia was also more common in age $\leq$ 50 years (78.9%). However, as per chi square test, this association

was not statistically significant as p value is >0.05. The table 7b shows that in 38% patients had H1N1 positive, 28% patients had pneumococci positive, in 10% patients no organism was identified. The table 8 shows that 75% patients with bacterial pneumonia had lobar involvement in chest x ray and 52.6% of H1N1 pneumonia had lobular involvement in chest x ray. The chi square test shows that this difference is statistically significant as p value is <0.05. In the present study, lobar pneumonia (54%) was the most common radiological feature on chest x ray. The table 9 indicates that 72.7% male and 75% female had required O2 support, 22.7% male and 14.2% female have required NIMV/IMV, 59.1% male and 50% female have developed a complication. This difference is not statistically significance as p value is >0.05. These results show that 77.7% of patients of age >50 years had required O2 support, 33.3% of patients of >50 years had needed NIMV/IMV, 50% of patients with >50 years had developed a complication. There is no statistically significant difference among above values as p value is >0.05. The table 9a shows that 66.6% bacterial pneumonia and 78.9% H1N1 pneumonia had required O2 support, 8.33% bacterial pneumonia and 26.3% H1N1 pneumonia had required NIMV/IMV, 66.6% bacterial pneumonia and 57.8% H1N1 pneumonia had developed a complication. This observation is statistically not significant as p value is >0.05. In this study, death had occurred in 8.33% bacterial pneumonia and 36.8% H1N1 pneumonia. This is statistically significant as p value is <0.05 by chi square test. The table 9b shows that 50% patients of class V had required O2 support and NIMV/IMV, 100% patients of class IV, had required O2 support and 50% patients had required NIMV/IMV,87.5% patients with class IV and 100% patients of class V had developed complication, 50% patients with class IV and class V had expired. This observation is statistically significant as p value is <0.05.

The table 10 shows that pleural effusion had occurred in 20.8% bacterial pneumonia and 5.26% H1N1 pneumonia. Respiratory failure had occurred in 12.5% bacterial pneumonia and 47.3% H1N1 pneumonia. The observation from the table 10 has statistically significant as p value is <0.05. The study shows that in expired male patients mean age is 57.75 years and in female was 44.2 years. The patients those who were expired due to bacterial pneumonia had mean age was 64 years and expired due to H1N1 pneumonia had mean age was 46.28 years. The respiratory failure (77.7%) was the most common complication in expired patients. Among expired patients' bronchopneumonia was seen in 66.6% patients and lobar pneumonia was observed in 33.3% patients on chest x ray. The DM (33.3%) was the most common risk factors in expired patients.

CONCLUSION AND DISCUSSION

In the present study, it is found that H1N1 is a most common pathogen (38%) in CAP followed by Streptococcus pneumoniae (28%). In the study of Larry G Reimer, others and study of Sanraj K Basi Streptococcus were most common etiology. This study was done between September 2014 to September 2015 duration. In this period H1N1 epidemic occurred in our region. So, in this study H1N1 was the most common etiology in CAP patients. In the present study, the most common presenting complaint was fever followed by a cough followed by breathlessness. In Mac Fariene study, etiology and outcome of CAP, a cough was a most common presenting complaint (92%) followed by fever (86%) and then breathlessness (67%).

Chest film showing infiltrates necessary to establish the diagnosis of pneumonia. Radiographic changes usually cannot be used to distinguish bacterial from nonbacterial

pneumonia, but they are often important for evaluating the severity of illness, determining the need for diagnostic studies and selecting an antibiotic agent. In the present study, most common chest x ray finding was patchy consolidation followed by left lower zone involvement and right lower zone involvement.

PSI (pneumonia severity index) score is used for determination of hospital admission and assess 30-days mortality. Clinical trials demonstrate that routine use of the PSI score results in lower admission rates for a class I and class II patients. Patients in class III could ideally be admitted to an observation unit until a further decision can be made. In the present study, mortality was 50% in class IV and class V patients.

PSI class	30-days mortality	In hospital mortality in present study
Class I	0.1%	-
Class II	0.6%	7.14%
Class III	2.8%	33.3%
Class IV	8.2%	50%
Class V	29.2%	50%

Implication for further research

For the further study, more data will be needed to do and conclude the findings. This study only has 50 participation which is one of the limitations of the study as well. Also, PSI score implementation for all patients who comes to the hospital with the clinical features of CAP which will give better data about PSI applicability and significance of PSI with the outcome. Also, observe and create a database on PSI score and respective treatment and then see what the outcome of the patients is. This implementation and suggestion will give a better dataset to reach a statistically significant conclusion about CAP.

Prevention and other important points to tackle CAP

Prevention of pneumonia involves either the decreasing likelihood of encountering

pathogen or Strengthening the host's response once the pathogen is encountered or Immunization like Pneumococci vaccine. Also, early antibiotic administration within 4-6 hours, empiric antibiotic treatment as per guidelines (IDSA / ATS), PORT – PSI scoring and Classification of cases, Early hospitalization in Class IV and V, Decrease smoking cessation - advice / counseling, Arterial oxygenation assessment in the first 24 hours, Blood culture collection in the first 24 h prior to another investigation, and Pneumococcal & Influenza vaccination.

Results Tables

TABLE 1. INCIDENCE BY AGE GROUP IN PATIENTS WITH CAP

	AGE (In years)	**MALE**		**FEMALE**		**TOTAL**
		No		No		No
≤50 Years	<21	1(4.5%)	12(40%)	1(3.6%)	20(24%)	2(4%)
	21-30	2(9%)		5(17.8%)		7(14%)
	31-40	2(9%)		6(21.4%)		8(16%)
	41-50	7(31.8%)		8(28.6%)		15(30%)
>50 Years	51-60	3(13.6%)	10(16%)	6(21.4%)	8(20%)	9(18%)
	61-70	5(22.7%)		2(7.1%)		7(14%)
	>70	2(9%)		0(0%)		2(4%)
TOTAL		**22(56%)**		**28(44%)**		**50(100%)**
Mean Age ± SD		***52±18***		***43±13***		***47±16***

TABLE 2. CLASSIFICATION OF PATIENTS ACCORDING TO PSI SEVERITY SCORE

CLASS	**MALE(n=22)**	**FEMALE(n=28)**	**TOTAL(n=50)**
I	4(8.00%)	13(26.00%)	17(34%)
II	5(10.00%)	9(18.00%)	14(28%)
III	6(12.00%)	3(6.00%)	9(18%)
IV	5(10.00%)	3(6.00%)	8(16%)
V	2(4.00%)	0(0.00%)	2(4%)

TABLE 3. PRESENTATION OF CLINICAL FEATURES ACCORDING TO AGE AND GENDER

Clinical Features	**Age**		**Gender**		**TOTAL(n=50)**
	≤50 Years	>50 Years	Male(n=22)	Female(n=28)	No
Fever	29(90.6%)	18(100%)	21(95%)	26(92%)	47(94%)
Cough	28(87.5%)	14(77.7%)	20(90%)	22(78%)	42(84%)
Expectoration	13(40.6%)	9(50%)	11(50%)	11(39%)	22(44%)
Breathlessness	22(68.7%)	14(77.7%)	17(77%)	19(67%)	36(72%)
Pleuritic chest pain	11(33.3%)	6(33.3%	7(31%)	10(35%)	17(34%)
Hemoptysis	1(3.1%)	2(11.1%)	2(9%)	1(3%)	3(6%)
Loss of weight	4(12.5%)	3(16.6%)	4(18%)	3(10%)	7(14%)

TABLE 4. PRESENTATION OF RISK FACTOR IN CAP PATIENTS

RISK FACTOR	**MALE**(n=22)	**FEMALE**(n=28)	**TOTAL**(n=50)
Preceding URTI	4(18.1%)	8(28.5%)	12(24%)
DM	2(9%)	5(17.8%)	7(14%)
Alcohol	5(22%)	0	5(10%)
Lung pathology	7(32%)	0	7(14%)
CHF	2(9%)	0	2(4%)
Smoker	12(54%)	0	12(24%)
Immunosuppressed	2(9%)	2(7.1%)	4(8%)
TB	1(4.5%)	1(3.5%)	2(4%)
GERD	1(4.5%)	4(14.2%)	5(10%)

TABLE 5. COMPARISON BETWEEN RISK FACTORS AND RADIOLOGICAL FINDINGS

CXR findings	**URTI(n=12)**	**DM(n=7)**	**Lung pathology(n=7)**	**Smoker(n=12)**	**GERD(n=5)**
Lobar involvement	2(16.7%)	3(42.9%)	4(57.1%)	3(25%)	2(40%)
Lobular involvement	10(83.3%)	4(57.1)	3(42.9%)	9(75%)	3(60%)

TABLE 6. BACTERIAL VS H1N1 PNEUMONIA WITH VARIOUS RISK FACTORS

Different CAP	URTI (n=12)	DM (n=7)	Lung pathology (n=7)	Smoker (n=12)	GERD (n=5)	Alcohol (n=5)
BACTERIAL PNEUMONIA	4(33.3%)	5(71.4%)	6(85.7%)	10(83.4%)	3(60%)	4(80%)
H1N1 PNEUMONIA	8(66.7%)	2(28.6%)	1(14.3%)	2(16.6%)	2(40%)	1(20%)

TABLE 7. ETIOLOGICAL CLASSIFICATION OF CAP PATIENTS

Etiology	MALE(n=22)	FEMALE(n=28)	TOTAL(n=50)
Bacteria	13(59%)	11(39.3%)	24(48%)
H1N1	7(31.8%)	12(42.9%)	19(38%)
Fungus	0	2(9%)	2(4%)
Unidentified	2(9%)	3(10.7%)	5(10%)

TABLE 7a. BACTERIAL VS H1N1 PNEUMONIA IN DIFFERENT AGE GROUP

Age Group	Bacterial pneumonia(n=24)	H1N1 pneumonia (n=19)
Age $\leq$ 50 years	16 (66.6%)	15 (78.9%)
Age > 50 years	8 (33.3%)	4 (21.1%)

TABLE 7b. MICROORGANISM IDENTIFIED IN CAP PATIENTS

ORGANISM	NO OF PATIENTS(n=50)
PNEUMOCOCCI	14(28%)
STAPHYLOCOCCI	2(4%)
MYCOPLASMA	1(2%)
PSEUDOMONAS	2(4%)
KLEBSIELLA	1(2%)
AFB	4(8%)
H1N1	19(38%)
CANDIDA ALBICANS	2(4%)
UNKNOWN ETIOLOGY	5(10%)

TABLE 8. RADIOLOGICAL PROFILE IN BACTERIAL AND H1N1 PNEUMONIA

RADIOLOGICAL PROFILE	BACTERIAL PNEUMONIA (n=24)	H1N1 PNEUMONIA (n=19)
LOBAR PNEUMONIA	18(75%)	9(31.5%)
BRONCHOPNEUMONIA	4(16.6%)	10(52.6%)

TABLE 9. SECONDARY OUTCOME OF CAP RELATED TO GENDER AND AGE

SECONDARY OUTCOME	MALE (n=22)	FEMALE (n=28)	Age ≤ 50 Years(n=32)	Age > 50 years(n=18)	TOTAL(n=50)
O2 SUPPORT	17(77.2%)	21(75%)	24(75%)	14(77.7%)	38(76%)
NIMV/IMV	5(22.7%)	4(14.2%)	3(9.3%)	6(33.3%)	9(18%)
COMPLICATION	13(59.1%)	14(50%)	18(75%)	9(50%)	27(54%)
ABSENCE FROM WORK ≤10 DAYS	10(45.5%)	23(82.1%)	23(71.8%)	10(55.5%)	33(66%)
ABSENCE FROM WORK >10 DAYS	3(13.6%)	5(17.8%)	5(15.6%)	3(16.6%)	8(16%)

TABLE 9a. OUTCOME RELATED TO ETIOLOGY

OUTCOME	BACTERIAL PNEUMONIA(n=24)	H1N1 PNEUMONIA(n=19)
O2 SUPPORT	16(66.6%)	15(78.9%)
NIMV/IMV	2(8.33%)	5(26.3%)
COMPLICATION	16(66.6%)	11(57.8%)
ABSENCE FROM WORK ≤10 DAYS	19(79.1%)	9(47.3%)
ABSENCE FROM WORK >10 DAYS	3(12.5%)	3(15.7%)
DEATH	2(8.33%)	7(36.8%)

TABLE 9b. OUTCOME RELATED TO PSI CLASS

	CLASS I (n=17)	CLASS II (n=14)	CLASS III(n=9)	CLASS IV(n=8)	CLASS V(n=2)
O2 SUPPORT	10(58.8%)	12(85.7%)	7(77.7%)	8(100%)	1(50%)
NIMV/IMV	0	0	4(57.1%)	4(50%)	1(50%)
COMPLICATION	4(23.5%)	7(50%)	7(77.7%)	7(87.5%)	2(100%)
ABSENCE FROM WORK ≤10 DAYS	14(77.7%)	11(78.6%)	8(88.9%)	7(87.5%)	2(100%)
ABSENCE FROM WORK >10 DAYS	3(17.6%)	3(21.4%)	1(11.1%)	1(12.5%)	0
DEATH	0	1(7.14%)	3(33.3%)	4(50%)	1(50%)

TABLE 10. DIFFERENT COMPLICATION IN CAP PATIENT

COMPLICATION	BACTERIAL PNEUMONIA (n=24)	H1N1 PNEUMONIA (n=19)	TOTAL(n=50)
EMPYEMA	1(4.16%)	-	1(2%)
PLEURAL EFFUSION	5(20.8%)	1(5.26%)	8(16%)
SEPTIC SHOCK	2(8.33%)	1(5.26%)	3(6%)
SEPTIC AKI	-	-	1(2%)
RESPIRATORY FAILURE	3(12.5%)	9(47.3%)	13(26%)
ARDS	-	1(5.26%)	1(2%)

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ANNEXURE I -ABBREVIATIONS

AFB – Acid fast bacilli

ARDS - Acute Respiratory Distress Syndrome

BBS - Bronchial breath sound

BP – Blood pressure

COPD- Chronic obstructive pulmonary disease

CAP - Community acquired pneumonia

CRP - C-reactive protein

CXR - Chest x-ray

CHF – Congestive heart failure

DM - Diabetes mellitus

ECG – Electrocardiogram

ESR – Erythrocyte sedimentation rate

ELISA - Enzyme linked immunosorbent assay

GERD - Gastro oesophageal reflux disease

HIV- Human immune deficiency virus

HR - Heart rate

ICU - Intensive care unit

IMV - Invasive mechanical ventilation

LFT – Liver function test

LRTI - Lower respiratory tract infection

NIMV - Non-invasive mechanic ventilation

PSI - Pneumonia severity index

RBS – Random blood sugar

RFT- Renal function test

RR - Respiratory rate

TC - Total count

URTI - Upper respiratory tract infection

USG - Ultrasonography

WBC – White blood cells

ANNEXURE II – PROFORMA

PROFORMA

Irno. Unit

Name DOA

Age DOD

Occupation

Address

CHIEF COMPLAINTS:

	Present/Absent	Duration	Others
Fever			
Cough			
Expectoration			
Breathlessness			
Chest Pain			

Haemoptysis			
Loss of Weight			

PREDISPOSING FACTORS:

PRECEDING URTI	ALLERGY
DM	PAST PNEUMONIA
ALTERED SENSORIUM	ASTHMA
ALCOHOL	TB
COPD/ILD/BRONCHIACTASIS	GERD
CHF	
SMOKER	
IMMUNOCOMPROMISED	

FAMILY HISTORY:

GENERAL EXAMINATION:

BUILT, NOURISHMENT, TEMPERATURE, PULSE, B.P., RESPIRATORY RATE, PALLER,

CYNOSIS, ICTERUS, CLUBBING, EDEMA, LYMPHADENOPATHY

SYSTEMIC EXAMINATION:

- RESPIRATORY SYSTEM:

  S/O Consolidation-

  S/O Effusion-

  S/O Obstructive Airway Disease-

- CARDIOVASCULAR:

- PER ABDOMEN:

- CNS:

INVESTIGATIONS:

HB, TC, HCT, PLT, FBS, PPBS, CREATININE, UREA, SODIUM, POTTASIUM, SPUTUM, GRAM STAIN, AFB, CULTURE, HBA1C, HIV, LFT, URINE, ALBUMIN, SUGAR, MICROSCOPY, CXR, ECG, 2DECHO, PNEUMOPANEL, H1N1, USG, CSF

DIAGNOSIS:

ADMISSION:

ICU, WARD, Days of Absence from work

TREATMENT: ANTIBIOTICS

- Cephalosporin + Macrolide
- Anti –Pseudomonal regimen
- A + Fluoroquinolones
- Other

COMPLICATIONS:

Septic shock, Endocarditis, Septic Encephalopathy, Respiratory Failure, Pleural effusion, Empyema

CHEST X RAY:

- LOBAR/BRONCHOPNEUMONIA
- UL/BL
- LATERAL VIEW

RESULT:

Survived/Expired