www.jmscr.igmpublication.org

Impact Factor 3.79
ISSN (e)-2347-176x

IGM Publication

Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

# A Study of Clinical Presentation and Outcome in Community Acquired Pneumonia in Hospitalised Adults

Authors

**Dr Seshagiri Rao Damaraju[1], Dr Raghavendra Rao Manukonda[2], Dr.M.Hussain[3].**

[1]Associate Prof. of Pulmonology, Rangaraya Medical Collage, Kakinada, Andhrapradesh, India
[2]Prof. & Hod Department of Pulmonology, ,Rangaraya Medical Collage, Kakinada, Andhrapradesh, India
[3]Postgraduate Student of Pulmonology, Rangaraya Medical Collage, Kakinada, Andhrapradesh, India

Corresponding Author
**Dr Damaraju Seshagiri Rao**
D.No 1-9-23, Sriram Nagar, Kakinada-533003. East Godhavari, Andharapradesh, India
Email: *drdsraosai@gmail.com* Ph: 919912577664

**ABSTRACT**

*Community-acquired pneumonia (CAP) is one of the most common infectious diseases addressed by clinicians. CAP is an important cause of mortality and morbidity worldwide.It is usually polymicrobial.*

*CAP is usually acquired via inhalation or aspiration of pulmonary pathogenic organisms into a lung segment or lobe. CAP morbidity and mortality are highest in elderly patients and in immunocompromised hosts. Patients who require hospital treatment for CAP are typically elderly persons; persons with underlying chronic obstructive pulmonary disease (COPD), such aschronic bronchitis (not emphysema); and individuals with severe CAP related to underlying cardiopulmonary function, immune status, or pathogen virulence.*

*Ambulatory CAP is most common among young adults and is usually due to atypical CAP pathogens (eg,* Mycoplasma pneumoniae*). Negative prognostic factors in community-acquired pneumonia (CAP) include preexisting lung disease, underlying cardiac disease, poor splenic function, advanced age, multilobar involvement, and delayed initiation of appropriate antimicrobial therapy*

*We conducted a prospective study in the hospitalised cases of community acquired pneumonia patients with regards to severity,clinical presentation,bacteriological study and response to culture specific antibiotics,course and outcome of the Community Acquired Pneumonia patients.*

**Keywords:** *Clinical Outcome. Etiology, Radiology, Specific Investigations And Treatment.*

**CLASSIFICATION AND BACTERIOLOGY OF CAP:**

CAP traditionally presents in two forms:

1. Typical
2. Atypical

1. 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-(dullness, increased VF/VR, egophony, bronchial breath sounds, WP and rales) may be found on physical examination and opacity in chest x-ray.

Most common pathogen in CAP is Strep. Pneumonia, but can also be due to H. influenzae and mixed anaerobic and aerobic components of oral flora.

2. The **atypical pneumonia** is characterized by -

- Gradual onset of fever,Dry cough, shortness of breath.
- A prominence of extra pulmonary symptoms-head ache, myalgia's, fatigue, sore throat, nausea, vomiting and diarrhoea, with minimal signs on chest x-ray .Atypical pneumonia is classically produced by-Mycoplasma pneumonia, can also be caused by Legionella pneumophila, chlamydia pneumoniae, oral anaerobes, and Pneumocystic jerovici and less frequently encountered pathogens Chlamydia psittaci, Coxiella burnettii, Francisella tularensis, Histoplasma capsulatum , coccidiodes immitis, and certain viruses also produce atypical pneumonia.

**Non-respiratory symptoms of CAP includes:**

- 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
- Signs of hypoxia,Metabolic disturbances,Maculopapular rash
- Bullous myringitis,Glomerulonephritis,Myalgias

INVESTIGATIVE PROFILE IN CAP:

LABORATORY TESTS

- Complete blood counts,Differential counts,
- C-Reactive Protein (CRP)
- Liver function tests
- Blood urea nitrogen,Serum creatinine
- Arterial blood gases

RADIOLOGY

- Chest x-ray PA & lateral view
- Consider need for CT chest with contrast, Echocardiogram, Ultrasound chest

MICROBIOLOGY

- Sputum- grams staining, culture & sensitivity
- Nasal swab for respiratory viruses
- Blood cultures

CONSIDER IN APPROPRIARTE SETTING:

- Pneumoccocal urinary antigen
- Legionella urinary antigen
- Histoplasma urinary antigen
- Acid fast staining of the sputum & culture for AFB
- Acute & convalescent sera for Mycoplasma, Chlamydia, Legionella, Coxiella, Histoplasma, Coccidioides, Tularemia
- HIV status
- Molecular assays

**CRITERIA FOR SEVERE COMMUNITY ACQUIRED PNEUMONIA**

**Baseline (minor) criteria** assessed at admission

- Respiratory rate > 30 min
- Severe respiratory failure (Pa,O2/Fi,O2 ratio < 250)
- Multilobar involvement in chest radiograph
- Systolic blood pressure < 90 mmHg
- Diastolic blood pressure < 60 mmHg
- Raised BUN
- Confusion

Major criteria assessed at admission or during clinical course

- Requirement fo mechanical ventilation
- Requirement of vasopressors >4 h (septic shock)

Other indices like SMART-COP and PSI scoring systems are also in vogue but are complex and practically not feasible.

**STUDY DESIGN**

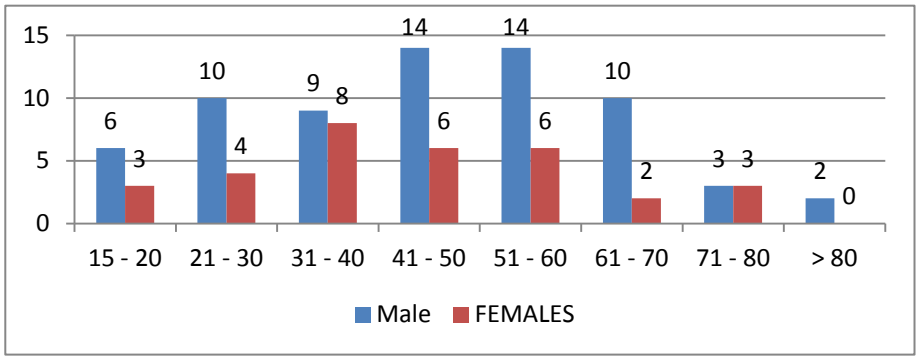
A prospective clinical study consisting of 100 Community Acquired Pneumonia (CAP) patients, who were admitted in GGH KAKINADA during NOV 2011 to SEPT 2013 is undertaken to study the clinical, radiological and bacteriological profile.

**Table No:1** – Age And Sex Distribution

The study group consists of 100 patients, out of which 68 (68%) were males and 32 (32%) were females. Patients of age 15 – 85 were included in this study.

| Age In Years | Males | Females | Total (N = 100) |
|---|---|---|---|
| 15 – 20 | 6 (6% ) | 3 (3%) | 9 (9% ) |
| 21 – 30 | 10 (10%) | 4 (4%) | 14 (14%) |
| 31 – 40 | 9 (9% ) | 8 (8%) | 17 (17%) |
| 41 – 50 | 14 (14%) | 6 (6%) | 20 (20%) |
| 51 – 60 | 14 (14%) | 6 (6%) | 20 (20%) |
| 61 – 70 | 10 (10%) | 2 (2%) | 12 (12%) |
| – 80 | 3 (3%) | 3(3%) | 6 (6%) |
| >80 | 2 (2%) | 0 | 2 (2%) |
| | 68 (68%) | 32 (32%) | 100 (100%) |

**Graph No.1:** Age And Sex Distribution




The mean age is 48 ± 16.6625.

Maximum number of patients were in the age group 41 – 50 years and 51- 60 years constituting 20% each.

Patients above 40 years constitute 61% of CAP.

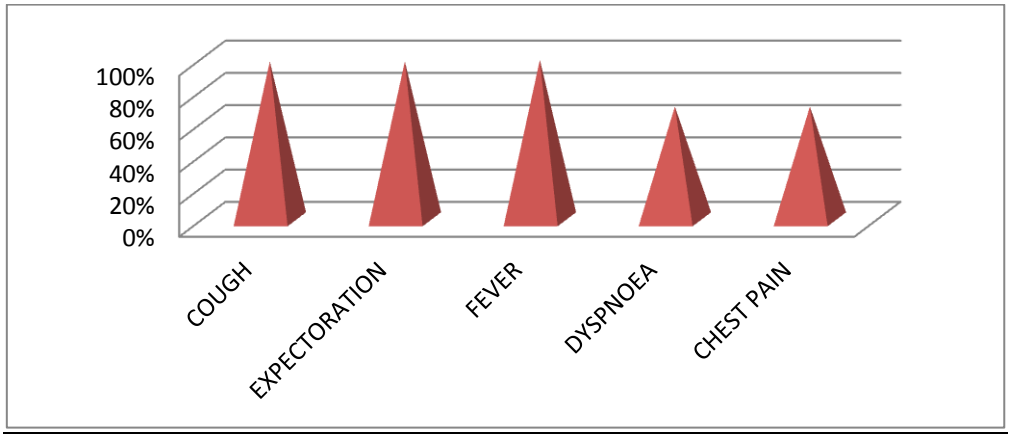
In the present study, 68% were males and 32 % were females.

**Clinical Presentation Of Community Acquired Pneumonia**

**Table No:2**

| **CLINICAL PARAMETER** | **TOTAL ( n = 100)** |
|---|---|
| Cough | 98 (98%) |
| Expectoration | 98(98%) |
| Fever | 99(99%) |
| Dyspnoea | 70 (70%) |
| Chest pain | 70 (70%) |

GRAPH SHOWING THE CLINICAL PRESENTATION OF CAP




All patients had fever, cough and expectoration (98%), majority (70%) had chest pain and an equal number had dyspnoea.

**Comorbidities At The Time Of Presentation**

**Table No:3**

| COMORBIDITY | TOTAL |
|---|---|
| COPD | 30 (30%) |
| DIABETES | 10 (10%) |
| HYPERTENSION | 7 (7 %) |
| CKD | 2 (2%) |
| HEPATIC DISEASE | 0 |
| NEUROLOGICALDISEASE | 0 |
| IMMUNOCOMPROMISED | 0 |

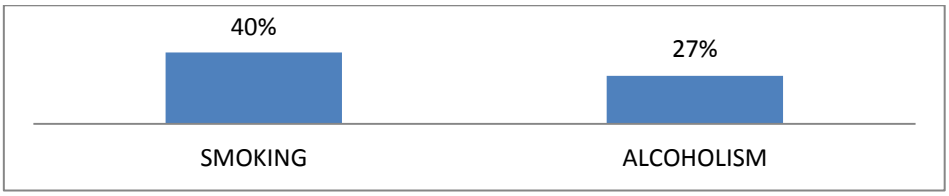
COPD is the most common and statistically significant comorbid condition associated with CAP ($p < 0.001$). Diabetes is present in 10 % of cases, hypertension in 7 %, chronic kidney disease in 2 % of cases.

**Risk Factors Associated With Cap**

**Table No: 4**

| RISK FACTOR | TOTAL( n =67) |
|---|---|
| SMOKING | 40 (40%) |
| ALCOHOLISM | 27 (27%) |
| DRUG ABUSE | 0 |

**Risk Factors For Cap**




Smoking is the most common risk factor associated with CAP ($p < 0.05$), accounting for 40 % of the cases. Alcoholism is associated with 27 % of CAP.

**General Physical Examination Findings Associated With Cap.**

**Table 5-** General Physical Examination Findings

| PARAMETER | TOTAL (n = 100) |
|---|---|
| PALLOR | 40 (40%) |
| CLUBBING | 4 (4%) |
| PEDAL EDEMA | 10 (10%) |

40 % of the study group were anaemic and 4 % had clubbing

**Vital Signs At The Time Of Presentation**

**Table 6-** Vital Signs

| PARAMETER | NO. OF PATIENTS | PERCENTAGE |
|---|---|---|
| TACHYPNOEA (>25/min) | 85 | 85 % |
| TACHYCARDIA | 80 | 80 % |
| TEMP > 38°C | 100 | 100 % |
| HYPOTENSION (SBP< 90mm Hg) | 3 | 3 % |
| $S_P O_2$ < 90 % | 18 | 18 % |

Most of the patients presented with tachypnoea (85%) and tachycardia (80%), 3% of the study group presented with hypotension and 18 % with respiratory failure.

**Severity Assessment Using Curb-65 Scoring System**

**Table No: 7**

| PARAMETER | NUMBER |
|---|---|
| CONFUSION | 3 (3%) |
| UREMIA | 1 (1%) |
| RESPIRATORY RATE > 30/min | 85 (85 %) |
| SYSTOLIC BLOOD PRESSURE < 90mm Hg | 3 (3%) |
| AGE > 65 YEARS | 16 (16 %) |

**Table No: 8**

| CURB – 65 SCORING SYSTEM | |
|---|---|
| **SCORE - SEVERITY** | NUMBER |
| 0 – 1 MILD | 82 (82%) |
| 2 MODERATE | 14 (14%) |
| ≥ 3 SEVERE | 4 (4%) |

CURB-65 is used to assess the severity.

Confusion at the time of presentation is seen in 3 (3%), uremia in 1 (1%), tachypnoea in 85 (85%), hypotension in 3 (3%), and age > 65 years in 16 (16%) of cases. Mild (0 – 1 score) is seen in 82 (82%), moderate (2 score) in 14 (14%), severe (4%) of cases.

**Examination Of The Respiratory System**

**Table No: 9**

| SIGNS | NO. OF PATIENTS |
|---|---|
| BRONCHIAL BREATH SOUNDS | 90 (90%) |
| ↑ VOCAL FREMITUS | 90 (90%) |
| ↑ VOCAL RESONANCE | 90 (90%) |
| WHISPERING PECTORILOQUY | 20 (20%) |
| CRACKLES | 25 (25%) |

On examination, 90 % showed signs of consolidation with bronchial breathing, ↑VF, ↑VR, 25 % showed adventitious sounds- crepitations.

**Lab Characteristics**

**Table No: 10** Hematological Findings

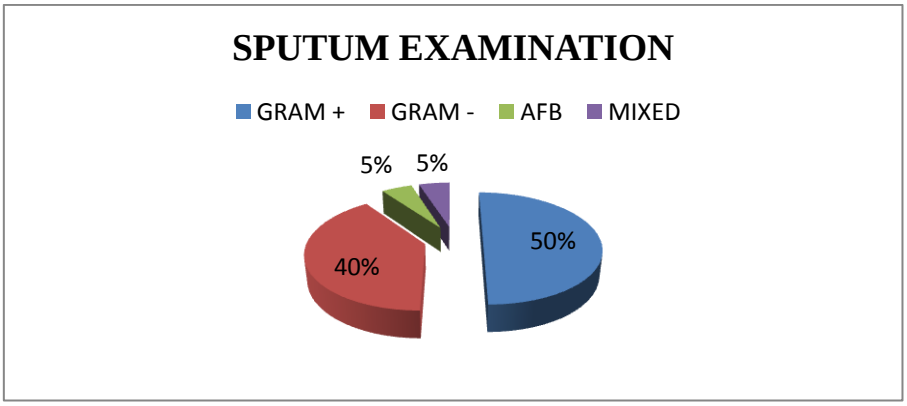
| PARAMETER | MEAN VALUE | RANGE |
|---|---|---|
| HEMOGLOBIN | 10.249 g/dl (±1.59) | 6 - 13 g/dl |
| TC | 10,704 (±3302.34) | 4,500 - 21,500 |
| DC | | |
| NEUTROPHILS | 74.82 (6.43) | 60 % - 90 % |
| LYMPHOCYTES | 22.1 (6.31) | 8 % - 36 % |
| RBS | 100.23 (21.81) | 68 – 165 |
| BLOOD UREA | 22.03 (4.59) | 14 – 40 |
| SERUM CREATININE | 1.06 (0.33) | 0.6 – 2.5 |

The mean haemoglobin value is 10.249 g/dl ± 1.59. The mean total leucocytic counts were 10,704 ±3302.34. Among the leucocytes the neutrophils mean value is 74.82. The total WBC counts varies from 4,500 – 21,500.

**Sputum Examination**

**Table No: 11 -** Grams Staining & Zn Staining Of The Sputum Samples

| | NUMBER (n=60) |
|---|---|
| GRAM POSITIVE COCCI | 30 (50%) |
| GRAM NEGATIVE BACILLI | 24 (40%) |
| AFB STAINING | 3 (5%) |
| MIXED | 3 (5%) |




The sputum grams staining predominantly showed gram positive cocci 50 % ($p < 0.001$).

40 % showed gram negative organisms. 5 % were sputum positive for AFB and 5% showed mixed organisms.

**Sputum Culture**

**Table No: 12**

| ORGANISM | NUMBER(n=50) |
|---|---|
| STREPTOCOCCUS | 17 (34%) |
| KLEBSIELLA | 10 (20%) |
| PSEUDOMONAS | 8(16%) |
| STAPHYLOCOCCUS | 7(14%) |
| E COLI | 6(12%) |

Sputum culture showed positive results in 50 (50%) patients, out of which *streptococcus pneumonia* is the predominant organism constituting 17/50 (34%), *klebsiella* in 10/50 (20%) patients, *pseudomonas* in 8/50 (16%), *staphylococcus* in 7/50 (14%), *E.coli* in 6/50 (12%) patients.

**Blood Cultures**

**Table No: 13**

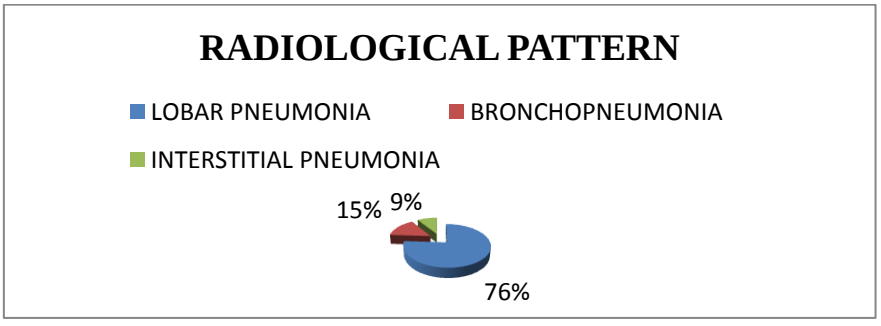
| ORGANISM | NUMBER (n=30) |
|---|---|
| STREPTOCOCCUS | 12 (40%) |
| STAPHYLOCOCCUS | 4 (13.3%) |
| KLEBSIELLA | 8 (26.6%) |
| PSEUDOMONAS | 4 (13.3%) |
| E COLI | 2 (6.6%) |

Blood cultures were positive in only 30 (30%) patients. *Streptococcus pneumonia* was isolated in 12/30 (40%) patients, *klebsiella* in 8/30 (26.6%), *staphylococcus* in 4/30 (13.33%), *pseudomonas* in 4/30 (13.33%), *E coli* in 2/30 (6.66%) patients.

**Radiological Findings In Chest X Ray**

**Table No: 14**

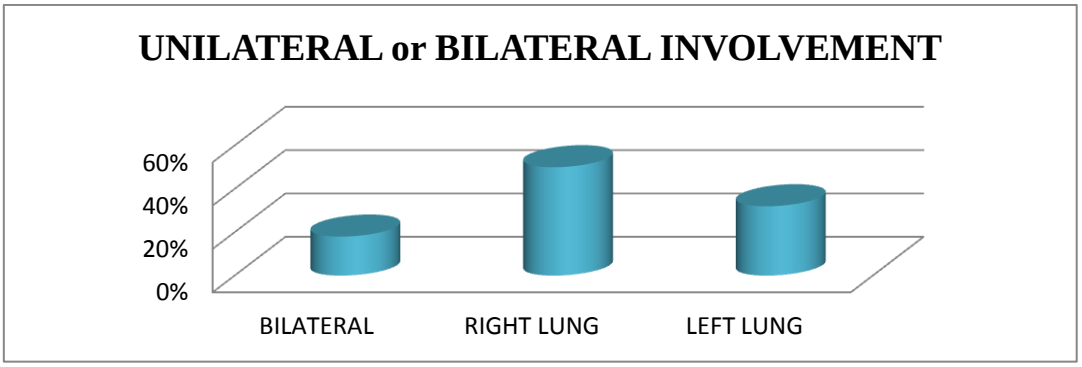
| RADIOLOGICAL PATTERN | NUMBER (n=100) |
|---|---|
| LOBAR CONSOLIDATION | 76 (76%) |
| BRONCHOPNEUMONIA | 15 (15%) |
| INTERSTITIAL PNEUMONIA | 9 (9%) |



Lobar consolidation was identified in 76 (76%) patients (p<0.001), bronchopneumonia in 15 (15%) patients, interstitial pattern in 9 (9%) patients. COPD changes were noted in 20 (20%) patients.

**Table No: 15**

| UNILATERAL/BILATERAL | NUMBER (n=100) |
|---|---|
| BILATERAL | 18 (18%) |
| UNILATERAL- RIGHT LUNG | 50 (50%) |
| UNILATERAL- LEFT LUNG | 32(32%) |




Right lung is involved in 50 (50%) patients (p<0.001), left lung in 32 (32%) patients, bilateral involvement in 18 (18%) patients.

Right upper lobe is involved in 18 (18%), middle lobe in 12 (12%), lower lobe in 20(20%), left upper lobe in 10(10%), lingula in 8 (8%), and lower lobe in 14 (14%) patients.

**COMPLICATIONS**

**Table No: 16**

| COMPLICATION | NUMBER |
|---|---|
| SYNPNEUMONIC EFFUSION | 26 (26%) |
| EMPYEMA | 5 (5%) |
| RESPIRATORY FAILURE | 12 (12%) |
| ARDS | 6 (6%) |
| LUNG ABSCESS | 2 (2%) |
| SEPSIS | 3 (3%) |
| DEATH | 3 (3%) |

Complications were seen in 34 (34%) cases.

Synpneumonic effusions were seen in 26 (26%), respiratory failure in 12 (12%), ARDS in 6 (6%), empyema in 5 (5%), lung abscess in 2(2%), sepsis in 3 (3%) patients.

Synpneumo

## SUMMARY AND CONCLUSIONS

- The age group in the study varied from 15 – 85 years, most of them were >40 years, constituting 61 %.
- The incidence of CAP is more common in men (68%), when compared with women (32%).
- COPD is significantly associated with CAP.
- The common risk factors for CAP were smoking and alcoholism.
- The commonest presenting symptoms were fever (99 %), cough (98 %) and expectoration (98 %), other symptoms include dyspnoea (70 %) and chest pain (70 %).
- The signs of consolidation – bronchial breath sounds, ↑VF, ↑VR were present in 90 % of patients. Added sounds – crepitations were present in 25 %.
- The haematological findings showed neutrophilic leucocytosis (73.82 %).
- Combining the sputum staining, sputum cultures and blood cultures, the aetiological agent was obtained in 50 % of cases. *Streptococcus pneumoniae* is the commonest cause in 17 (34%) of cases, *klebsiella* in 10 (20%) of cases, *pseudomonas* in 8 (16%) of cases, *staphylococcus* in 7(14%) of cases, *E.coli* in 6 (12%), and *Mycobacterium tuberculosis* in 2 (4%) of cases.
- In the chest x ray, lobar pneumonia is the commonest pattern, seen in 76%. Lower lobes are commonly involved.
- Complications were seen in 34 cases out of which 3 were died.
- Most of the patients responded to antibiotics alone.
- Prognosis was good in this study.
- CURB- 65 score is a very sensitive indicator for the assessment of severity and predicting the mortality.
- The mortality was associated with male gender, COPD, smoking, alcoholism, bacteremic pneumonia, septic shock, ARDS, requirement of invasive mechanical ventilation.

REFERENCES:


1. Sharma BB, Singh V. Indian pneumonia guidelines ,Lung India 2012;29:307-8
2. Murphy S, XUJ, Kochanek K et al, Preliminary data 2010,National vital statistics report 2012;60(4):1-52
3. Shah et al, bacteriological and clinical profile of CAP in hospitalised patients, lung india, volume 27, issue 2, april-june 2010.
4. Fishmans text book of pulmonary diseases and disorders, 4th edition, volume 2:1969-1973.
5. Douglas Seaton, crofton and douglas respiratory diseases, 5th edition, volume 1, chapter 13, 356
6. Murray & Nadal textbook of respiratory medicine 4th edition,2007:chapter 32;1288/278

7. B.D. Chaurasia, text book of human anatomy, 4TH edition, volume 1, chapter 16, pages 223- 231.
8. Ross and Wilson, text book of anatomy and physiology in health and illness, 9th edition, page 249-251.
9. Reynolds HY: Respiratory infections may reflect deficiencies in host defense mechanisms. Dis Mon 31:1–98, 1985.
10. Robbins Basics Pathology 8th edition,chapter 13,509-513
11. File TM. Community-acquired pneumonia. Lancet 2003; 362: 1991 – 2001.
12. Thomas J Marrie, fishmans text book of pulmonary diseases and disorders, 4th edition, volume 2:2097-2114.
13. Douglas Seaton, crofton and douglas respiratory diseases, 5th edition, volume 1, chapter 13, 358-366
14. Mark L Levya, Ivan Le Jeuneb, Mark A Woodheadc, John T Macfarlaned, Wei Shen Limd, British Thoracic Society Community Acquired Pneumonia in Adults Guideline Group, Primary Care Respiratory Journal (2010); 19(1): 21-27.
15. Douglas Seaton, crofton and douglas respiratory diseases, 5th edition, volume 1, chapter 13,358-366.