A knowledge of community acquired pneumonia (CAP), it’s prevalence, etiology and clinical profile forms a vital part of understanding the epidemiology of these infections with respect to different hospital settings and geographical locations. Our study over a 5 month period comprised 102 patients presenting with pneumonia. A detailed history, blood tests, cultures of respiratory samples & blood were done. Statistical analysis was done by percentage calculations. Of the 102 cases CAP was diagnosed in 35 (34%) cases. Diabetes mellitus (20%) was the most common pre-disposing factor followed by COPD in (17%). The most common pathogen from sputum was *Klebsiella pneumonia* (11.0%).

The most common isolate from blood culture was *Klebsiella pneumoniae* (7.8%) followed by *Streptococcus pneumoniae* (5.8%) each, *Staphylococcus aureus* (3.9%) each, *Streptococcus pneumoniae* 3 (2.9%), *Moraxella catarrhalis* 2 (1.9%) and *Streptococcus pyogenes* (0.9%). The microbial etiology in 4 of the 10 patients who died. The microbial etiology in 4 of the 10 patients who died.

**Microbiology**

- Community acquired pneumonia
- Blood culture
- Sputum culture

**KEY WORDS:** Community acquired pneumonia, blood culture, sputum culture.

**Aknowledgement:**

Community acquired pneumonia (CAP), its prevalence, etiology and clinical profile forms a vital part of understanding the epidemiology of these infections with respect to different hospital settings and geographical locations. Our study over a 5 month period comprised 102 patients presenting with pneumonia. A detailed history, blood tests, cultures of respiratory samples & blood were done. Statistical analysis was done by percentage calculations. Of the 102 cases CAP was diagnosed in 35 (34%) cases. Diabetes mellitus (20%) was the most common pre-disposing factor followed by COPD in (17%). The most common pathogen from sputum was *Klebsiella pneumonia* (11.0%) followed by *Acinetobacter species* 8 (7.8%). *Pseudomonas aeruginosa* and *E. coli* 6 (5.8%) each, *Staphylococcus aureus* 4 (3.9%) each, *Streptococcus pneumoniae* 3 (2.9%), *Moraxella catarrhalis* 2 (1.9%) and *Streptococcus pyogenes* 1 (0.9%).

The most common isolate from blood culture was *Klebsiella pneumoniae* 7 (6.8%) followed by *Pseudomonas aeruginosa* and *E. coli* 6 (5.8%) each. A total of 10 patients, 6 males and 4 females, died. The microbial etiology in 4 of the 10 patients who died during hospitalization could not be ascertained.

**Discussion:**

CAP still remains a major reason for admission and a common cause of death particularly in developed countries. With various epidemiological data world wide still an in-depth survey is lacking touching crucial aspects of CAP particularly in southern parts of the Indian subcontinent. The number of patients may also be under reported as CAP is not included as a notifiable disease, and local physicians often rely on clinical presentation of the patient. In routine laboratory testing, fastidious organisms such as *Chlamydia*, *Mycoplasma* and *Legionella* species cannot be grown, unless special culture media are used. A study by RC She et al claims that the recovery of *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* in culture is low, hence only serology or molecular methods are good to clinch the diagnosis. Technically, the diagnosis of CAP is often cumbersome and often missed due to poor sample quality, lack of history and the overall often low yield.

Here we discuss the diversity of this disease in comparison with studies within India and abroad. It could still be the tip of the iceberg phenomenon as population based studies although have been reported, there still remains very little information of outpatients being treated in other primary health care centres or even by family physicians. The rural and semi-urban health facilities do not routinely advise radiographs and an empiric antibiotic therapy will invariably be started regardless of the etiology. Specialist services for microbiological diagnosis by culture and occasionally supported by serology remains a rural health centres dream.

**Results:**

Of the 102 cases, the mean age of patients were 62.3 (range 19-90 years). There were 70 males and 32 females. 56 patients were in the sixth to eighth decades of life. Most of them were in the age group 60-75 years. Those above 60 years of age were more pre-disposed to CAP. The number of patients presenting with classical features of CAP like fever (66%), cough (72%), tachycardia (68%), pleuritic chest pain (64%) and productive sputum (64%), and leucocytosis (60%) were 35 (34%).

Smoking as a pre-disposing factor was identified in (20%) followed by COPD in (17%), structural lung disease in (18%), diabetes mellitus in (25%), altered consciousness in (5%) and chronic alcoholism in (15%). Rates of isolation of organisms were sputum 41/100, blood 19/100. Chest radiograph findings corroborated with 21 cases and the microbiological diagnosis of CAP with sputum and blood cultures were possible only in 19 cases. The most common organism isolated from sputum were *Klebsiella pneumonia* 11 (10.7%) followed by *Acinetobacter species* 8 (7.8%), *Pseudomonas aeruginosa* and *E. coli* 6 (5.8%) each, *Staphylococcus aureus* 4 (3.9%) each, *Streptococcus pneumoniae* 3 (2.9%), *Moraxella catarrhalis* 2 (1.9%) and *Streptococcus pyogenes* 1 (0.9%).

**Introduction:**

CAP is a common, potentially serious illness causing morbidity and mortality worldwide. About 4 million cases occur annually and 20% of them require hospitalization. It’s etiology varies with location and time. The most common organism in India is *S. pneumoniae*. Other implicated genera are *Chlamydia*, *Hemophilus*, *Legionella*, *Moraxella*, *Mycoplasma* and *Staphylococcus*. The risk factors for CAP are age older than 65 years, immunodeficiency, chronic obstructive pulmonary disease, asthma and other pulmonary conditions.

**Methods:**

This prospective study was done at the department of Microbiology for a period of 5 months screening 102 cases. After obtaining informed consent a history of fever, cough, and signs of pleuritic chest pain were noted at admission. Sputum, suction tip aspirates & bronchoalveolar lavage (BAL) were processed using Bactec 9120. Additionally a complete hemogram, chest X-ray, blood tests, cultures of respiratory samples & blood were done. Statistical analysis was done by percentage calculations. Of the 102 cases CAP was diagnosed in 35 (34%) cases. Diabetes mellitus (20%) was the most common pre-disposing factor followed by COPD in (17%). The most common pathogen from sputum was *Klebsiella pneumonia* (11.0%) followed by *Acinetobacter species* 8 (7.8%). *Pseudomonas aeruginosa* and *E. coli* 6 (5.8%) each, *Staphylococcus aureus* 4 (3.9%) each, *Streptococcus pneumoniae* 3 (2.9%), *Moraxella catarrhalis* 2 (1.9%) and *Streptococcus pyogenes* 1 (0.9%). The microbial etiology in 4 of the 10 patients who died during hospitalization could not be ascertained.

**Discussion:**

CAP still remains a major reason for admission and a common cause of death particularly in developed countries. With various epidemiological data world wide still an in-depth survey is lacking touching crucial aspects of CAP particularly in southern parts of the Indian subcontinent. The number of patients may also be under reported as CAP is not included as a notifiable disease, and local physicians often rely on clinical presentation of the patient. In routine laboratory testing, fastidious organisms such as *Chlamydia*, *Mycoplasma* and *Legionella* species cannot be grown, unless special culture media are used. A study by RC She et al claims that the recovery of *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* in culture is low, hence only serology or molecular methods are good to clinch the diagnosis. Technically, the diagnosis of CAP is often cumbersome and often missed due to poor sample quality, lack of history and the overall often low yield.

Here we discuss the diversity of this disease in comparison with studies within India and abroad. It could still be the tip of the iceberg phenomenon as population based studies although have been reported, there still remains very little information of outpatients being treated in other primary health care centres or even by family physicians. The rural and semi-urban health facilities do not routinely advise radiographs and an empiric antibiotic therapy will invariably be started regardless of the etiology. Specialist services for microbiological diagnosis by culture and occasionally supported by serology remains a rural health centres dream.

**Results:**

Of the 102 cases, the mean age of patients were 62.3 (range 19-90 years). There were 70 males and 32 females. 56 patients were in the sixth to eighth decades of life. Most of them were in the age group 60-75 years. Those above 60 years of age were more pre-disposed to CAP. The number of patients presenting with classical features of CAP like fever (66%), cough (72%), tachycardia (68%), pleuritic chest pain (64%) and productive sputum (64%), and leucocytosis (60%) were 35 (34%).

Smoking as a pre-disposing factor was identified in (20%) followed by COPD in (17%), structural lung disease in (18%), diabetes mellitus in (25%), altered consciousness in (5%) and chronic alcoholism in (15%). Rates of isolation of organisms were sputum 41/100, blood 19/100. Chest radiograph findings corroborated with 21 cases and the microbiological diagnosis of CAP with sputum and blood cultures were possible only in 19 cases. The most common organism isolated from sputum were *Klebsiella pneumonia* 11 (10.7%) followed by *Acinetobacter species* 8 (7.8%), *Pseudomonas aeruginosa* and *E. coli* 6 (5.8%) each, *Staphylococcus aureus* 4 (3.9%) each, *Streptococcus pneumoniae* 3 (2.9%), *Moraxella catarrhalis* 2 (1.9%) and *Streptococcus pyogenes* 1 (0.9%).

The microbial etiology in 4 of the 10 patients who died during hospitalization could not be ascertained.

**Discussion:**

CAP still remains a major reason for admission and a common cause of death particularly in developed countries. With various epidemiological data world wide still an in-depth survey is lacking touching crucial aspects of CAP particularly in southern parts of the Indian subcontinent. The number of patients may also be under reported as CAP is not included as a notifiable disease, and local physicians often rely on clinical presentation of the patient. In routine laboratory testing, fastidious organisms such as *Chlamydia*, *Mycoplasma* and *Legionella* species cannot be grown, unless special culture media are used. A study by RC She et al claims that the recovery of *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* in culture is low, hence only serology or molecular methods are good to clinch the diagnosis. Technically, the diagnosis of CAP is often cumbersome and often missed due to poor sample quality, lack of history and the overall often low yield.

Here we discuss the diversity of this disease in comparison with studies within India and abroad. It could still be the tip of the iceberg phenomenon as population based studies although have been reported, there still remains very little information of outpatients being treated in other primary health care centres or even by family physicians. The rural and semi-urban health facilities do not routinely advise radiographs and an empiric antibiotic therapy will invariably be started regardless of the etiology. Specialist services for microbiological diagnosis by culture and occasionally supported by serology remains a rural health centres dream.
Conclusions: Many issues still remain with respect to the diagnosis of CAP. The etiological agents vary from cultivable to non-cultivable pathogens thus requiring supportive serological tests and molecular intervention. Together with the available diagnostic modalities, a good knowledge of the clinical presentations and common risk factors of CAP will go a long way in effective management of these cases.

References:
1. Shah BA, Singh G, Naik MA, Dhob GN. Bacteriological and clinical profile of Community acquired pneumonia in hospitalized patients. Lung India 2010;27:54-5.
2. Garibaldi RA. Epidemiology of community acquired respiratory tract infections in adults: Incidence, etiology and impact. Am J Med 1985;78:325-7.
3. M. Nawal Lurflwy, Eric Hentzer, Linda F. Chang, et al. Diagnostic performance of community-acquired pneumonia. Am Fam Physician. 2006;73(3):442-450.
4. Herman Groosman and Paul Little. Community acquired pneumonia in primary care BMJ. 2006;332(7549):1045-1046.
5. K H Wong, S K Skelton and Y K Chan. Efficient culture of Chlamydia pneumoniae with cell lines derived from the human respiratory tract. J. Clin.Microbiol. 1992;30(7):1625-1630.
6. Kashyap et al. Comparison of PCR, culture & serological tests for the diagnosis of Mycoplasma pneumoniae in community-acquired lower respiratory tract infections in children. Indian J Med Res 2012;136:134-139.
7. Ambunani et al. Isolation of Legionella pneumoniae from clinical & environmental sources in a tertiary care hospital. Indian J Med Res 2010;131:761-764.
8. RC She et al. Limited utility of polymerase chain reaction and Chlamydophila pneumoniae for diagnosis of respiratory tract infections. J. Clin Microbiol. 2010;48(9):3380-2.
9. Karen C. Carroll. Laboratory Diagnosis of Lower Respiratory Tract Infections: Controversy and Consensus. J. Clin Microbiol. 2002;40(9):3115-3120.
10. Bradley et al. Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. Clin Infect Dis. 2011;53(7):25-76.
11. J Almirall, I. Boílset, I. Vidal, et al. Respiratory virus testing in community-acquired pneumonia: a systematic review. Eur Respir J 2000;15:757-763.
12. The global burden of the disease. 2004 update. Available at:http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004_update_full.pdf. Accessed on Accessed on: July 11, 2012.
13. Card JD, Wunderink, Grant W. Waterer. Community Acquired Pneumonia. N Eng J Med 1997;337:540-551.
14. Chalmers JD, Mandal P, Singanayagam A, et al. Severity assessment tools to guide ICU admission in community-acquired pneumonia: systematic review and meta-analysis. Intensive Care Med 2011;37:1409-20.
15. Wiemken T, Kelley R, Ramirez J. Clinical scoring tools: which is best to predict clinical response and long-term outcomes? Infect Dis Clin North Am 2013;27:33-48.
16. Fine MJ, Ablin TE, Vealy DM, et al. A prediction rule to identify low-risk patients with community-acquired pneumonia. N Engl J Med 1997;336:243-50.
17. Lim WS, van der Eerden MM, Laing R, et al. Defining community acquired pneumonia severely on presentation to hospital: an international derivation and validation study. Thorax 2003;58:377-82.
18. Mandell LA, Wunderink RG, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis 2007;44(Suppl 2):S2-S72.
19. Chalmers JD, Taylor JK, Mandal P, et al. Validation of the Infectious Diseases Society of America/American Thoracic Society minor criteria for intensive care unit admission in community-acquired pneumonia patients without major criteria or contraindications to intensive care unit care. Clin Infect Dis 2011;53:503-11.
20. Obero A, Agarwal A. Bacteriological profile, Serology and antibiotic Sensitivity pattern of microorganisms from community acquired Pneumonia. JK Sci 2008;6(2):79-82.
21. Bansal S, Kashyap S, Pal LS, Goel A. Clinical and Bacteriological profile of community acquired pneumonia in Shrimal, Himachal Pradesh. Indian J Chest Dis Allied Sci 2004;46:17-22.
22. Bartlett JR, Goldf D, Mandell LA, Fye TM Jr, Musher DM, Fine MJ. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. Clin Infect Dis 2000;31:347-82.
23. Sharma BK, Manjunath S, Varma S. Profile of pneumonias in hospitalized medical patients. Indian J Chest Dis Allied sci 1988;30:199-204.
24. Waterer GW, Keider LA, Wunderink RG. Delayed microbiological testing and atypical presentation in community acquired pneumonia. Chest 2006;130:1-15.
25. Community-Acquired Pneumonia in Adults: Guidelines for Management. John G. Bartlett, Robert F. Bremner, Lionel A. Mandell, and Thomas M. File Jr. Clin Infect Dis 1998;26:811-38.
26. Severe meningococcal-streptococcal sepsis associated with community-acquired pneumonia: an observational study. December 2006–January 2007. MMWR Morb Mortal Wkly Rep 2007;56:325-9.
27. Bacterial infections in lung tissue specimens from fatal cases of 2009 pandemic influenza A (H1N1) — United States, May–August 2009. MMWR Morb Mortal Wkly Rep 2009;58:1071-4.
28. Sheng ZM, Chertov DS, Ambroggio X, et al. Autopsy series of 68 cases dying before and during the 1918 influenza pandemic peak. Proc Natl Acad Sci USA 2011;108:16416-21.
29. Johansson N, Kallin M, Tveljung-Andell A, Gisle CG, Hedlund J. Etiology of community-acquired pneumonia: increased microbiological yield with new diagnostic methods. Clin Infection Dis 2010;50:202-9.
30. Oosterheert JJ, van Loon AM, Schuurman R, et al. Impact of rapid detection of viral and atypical bacterial pathogens on mortality and length of stay for patients with lower respiratory tract infection. Clin Infection Dis 2005;41:1438-44.
31. Johnstone J, Maynard SR, Fox JD, Marrie TJ. Viral infections in adults hospitalized with community-acquired pneumonia: prevalence, pathogens, and presentation. Chest 2008;134:1411-8.
32. RSA AT. What is the role of viral respiratory infections in community-acquired pneumonia? What is the best therapy for influenza and other viral causes of community-acquired pneumonia? Infect Dis Clin North Am 2013;27:157-75.
33. Kulpadi DDS, Kumar A, Flexner MA. Mycoplasma pneumoniae in lower respiratory tract infections. Indian J Chest Dis Allied Sci 1980;22:39-46.
34. Kulpadi DD, Khagti Tr. Reappraisal of pneumonias. JARP 1988;36:660-4.
35. Sharma BK, Manjunath S, Varma S. Profile of pneumonias in hospitalized medical patients.
36. Bartlett JG. Bacteriological diagnosis of pulmonary infections. In: Sackner MA, editor. Diagnostic techniques in pulmonary disease. Part 1. New York: Marcel Dekker Inc; 1980. p. 707-45.

37. Wollschlager C, Khan F. The contribution of blood cultures to the diagnosis and management of community acquired pneumonia. Am Rev Respir Dis 1985;131:80.

38. Ishida T, Kashimoto T, Arta M, Ito I, Osawa M. Etiology of community acquired pneumonia in hospitalized patients: A three year prospective study in Japan. Chest 1998;114:1588-93.

39. Kalin M, Lindberg AA, Olausson EH. Diagnosis of pneumococcal pneumonia by agglutination and counterimmunoelectrophoresis of sputum samples. Eur J Clin Microbiol, 1982;1:91-96.

40. Macfarlane J. Community acquired pneumonia. Br J Dis Chest 1987;81:116-27.

41. Ortqvist A, Hedlund J, Grifner L, Jalonen E, Kallings L, Leinonen M, et al. Aetiology, outcome and prognostic factors in community acquired pneumonia requiring hospitalization. Eur Respir J 1990;3:1105-13.

42. Pachon J, Prados MD, Capote I, Cuello JA, Gamacho J, Verano A. Severe community acquired pneumonia: Etiology, prognosis and treatment. Am Rev Respir Dis 1990;142:369-73.