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A PROSPECTIVE OBSERVATIONAL STUDY ON THE PREVALENCE, ANTIBIOTIC PRESCRIBING PATTERN AND ASSESSMENT OF HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH LOWER RESPIRATORY TRACT INFECTIONS

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ABSTRACT

A prospective observational study was conducted on 100 patients to assess the prevalence, antibiotic prescribing patterns, and health-related quality of life (QoL) in patients with Lower Respiratory Tract Infections (LRTIs), which include bronchitis, bronchiolitis, and pneumonia. LRTIs occur when there is an infection of the lungs, typically caused by viruses, bacteria, or other organisms, and are more prevalent in the paediatric population than in adults and geriatrics. The study aimed to evaluate the prevalence of LRTI, study antibiotic prescribing trends, and assess QoL using the SF-36 questionnaire. Data were collected from patients in the Pulmonary, Critical Care, and Sleep Medicine department, where LRTI was found to be the most prevalent respiratory disease. Prevalence was higher in paediatric patients and males compared to other groups. Prescriptions were analyzed, revealing that the most commonly prescribed antibiotics were Cephalosporins such as Cefuroxime, Cefoperazone Sulbactam, and Ceftriaxone; followed by Macrolides like Clarithromycin and Azithromycin; Penicillins including Amoxicillin Clavulanic acid and Piperacillin Tazobactam; and the Carbapenem Meropenem. Patients were provided with counselling and a Patient Information Leaflet (PIL) to enhance their understanding and adherence, and the SF-36 QoL questionnaire was used both before and after counselling, with follow-up after two weeks. A significant improvement in health-related QoL was observed post-intervention, leading to the conclusion that LRTI is the most common respiratory disease in the setting studied, particularly affecting paediatrics and males, and that appropriate antibiotic therapy combined with patient education significantly improves QoL outcomes.

KEYWORDS: LRTI, Prevalence, Antibiotics, Quality of Life, SF-36 Questionnaire.

1. INTRODUCTION

- Lower respiratory tract infections are infections that affect the airways, including the trachea and the alveolar sacs. This infection is usually caused by a virus, bacteria or other less common organisms.
- LRTIs are characterized in many different ways such as Bronchitis, Bronchiolitis and Pneumonia. [1]
- ➤ This study aimed to assess the Antibiotic prescribing pattern, Prevalence and Health related quality of life in patients by giving proper patient counselling.
- Prevalence is the total number of existing cases of disease in a population at a specific period of time.
- Generally, paediatric population are mostly affected by LRTI than adult and geriatric population. When compared to women, men are commonly affected by LRTI.
- Antibiotics are the most commonly prescribed drug for patients with LRTI. Antibiotic prescribing pattern in LRTI is the initial step towards antibiotic stewardship programs and to assess the rationality of antibiotics in patients with LRTI. This aims at ensuring the reduction in irrational antibiotic prescribing which can lead to therapeutic failure and bacterial resistance, adverse effects, morbidity and

www.wjpmr.com | Vol 11, Issue 10, 2025. | ISO 9001:2015 Certified Journal | 255

- mortality, economic burden and fall in the quality of treatment.
- Quality of life was assessed by using questionnaire SF-36.
- ➤ SF-36 Questionnaire is a 36 item scale, which measures eight domains of health status such as physical functioning, physical role, pain, general health, vitality, social functioning, emotional role and mental health.
- ➤ SF -36 Questionnaire is used to assess the Health Related quality of Life (HRQOL).
- An appropriate treatment regimen for the patient with Lower Respiratory Tract Infection usually can be established by patient history, physical examination, chest radiograph and properly collected sputum for culture interpreted in light of current knowledge of the most common lung pathogens and their antibiotic susceptibility patterns within the community.

1.1. RESPIRATORY TRACT INFECTIONS

- Respiratory tract infections (RTIs) are defined as any infectious disease of the upper or lower respiratory tract.
- ➤ Upper Respiratory Tract Infection is a common viral

- infection that affects the nose, sinuses, throat and airways. It includes Common Cold, Laryngitis, Pharyngitis, Acute Rhinitis, Acute Rhinosinusitis and Acute Otitis Media.
- Lower Respiratory Tract Infections are infections that affect the airways, including the trachea, bronchi, bronchioles and the alveolar sacs. It includes Bronchitis, Bronchiolitis and Pneumonia.

1.2. LOWER RESPIRATORY TRACT INFECTION

- Lower Respiratory Tract Infections include infectious processes of the lungs and Bronchi, Pneumonia, Bronchitis, Bronchiolitis and Lung Abscess.
- ➤ Infections in the Lower Respiratory Tract occur when the defence mechanism are impaired, such as with dysgammaglobulinemia or compromised ciliary function caused by the chronic inflammation that accompanies cigarette smoking. In addition, local defences may be overwhelmed when a particularly virulent microorganism or excessive inoculum invades lung parenchyma. Lower respiratory tract infection in children and adults are most commonly a result of either viral or bacterial invasion of lung parenchyma. [1]

256



Figure 1.2: Lower Respiratory Tract Infection. [2]

CLASSIFICATION

LRTI includes three types: a)Bronchitis b)Bronchiolitis c)Pneumonia $^{[2]}$

1.2.1. BRONCHITIS

Bronchitis is the inflammatory condition of the large and small elements respectively, of the tracheo-bronchial tree that is usually associated with a generalized respiratory infection. The inflammatory process does not extend to the alveoli. Bronchitis is frequently classified as acute and chronic. Acute Bronchitis occurs in all ages and Chronic Bronchitis primarily affects adults. [3]

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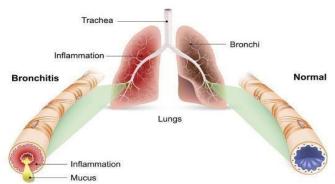


Figure 1.2.1: Bronchitis.[4]

1.2.1.1. ACUTE BRONCHITIS EPIDEMOLOGY

- Acute Bronchitis most commonly occurs during the winter months.
- Cold, damp climates and the presence of high concentrations of irritating substances such as air pollution or cigarette smoke.

ETIOLOGY

- Respiratory viruses are by far the most common infectious agents associated with Acute Bronchitis. [3]
- The common cold viruses, Rhinovirus and Corona virus and lower respiratory tract pathogens, including Influenza virus, Adenovirus and Respiratory Syncytial Virus are the major causative agents.
- Mycoplasma pneumonia also appears to be a frequent cause of acute bronchitis. Additionally chlamydia pneumoniae and Bordetella pertussis (the agent responsible for whooping cough) have been associated with acute respiratory tract infections.^[4]

 Although a variety of bacteria including Streptococcus pneumoniae, Staphylococcus and Haemophilus species may be isolated from throat or sputum culture, these organisms probably represent by normal flora.

PATHOGENESIS

Acute Bronchitis is primarily a self - limiting illness and rarely a cause of death. In general infection of the trachea and bronchi yields hyperemic and edematous mucous membranes with an increase in bronchial secretions. Destruction of respiratory epithelium can range from mild to extensive and may affect bronchial mucociliary function. In addition the increase in bronchial secretion which can become thick and tenacious, further impaires mucociliary activity. Recurrent acute respiratory infections may be associated with increased hyperreactivity and possibly the pathogenesis of Chronic Obstructive Lung Disease(COPD).^[5]

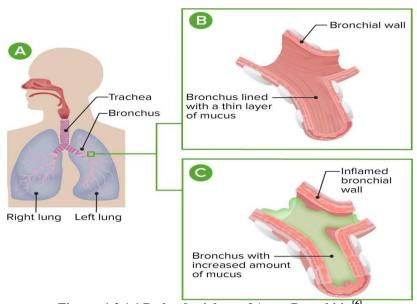


Figure: 1.2.1.1.Pathophysiology of Acute Bronchitis. [6]

CLINICAL PRESENTATION[5]

- Cough
- Malaise

- Headache
- Coryza
- Sore throat

- Mucopurulent sputum
- Dyspnea
- Cyanosis
- Halitosis
- Obesity
- Chest soreness
- Runny nose

DIAGNOSIS^[5]

- Chest radiograph
- Chest examination
- Viral antigen detection test
- Culture test
- Pulmonary function tests

NON -PHARMACOLOGICAL TREATMENT^[6]

- Bed rest
- Drink fluids to prevent dehydration and to possibly decrease the viscosity of respiratory secretions.

PHARMACOLOGICAL TREATMENT^[6]

i. ACETAMINOPHEN

Mechanism of action

Acetaminophen has a central analgesic effect that is mediated through activation of descending serotonergic pathways. Debate exists about its primary site of action, which may be inhibition of prostaglandin (PG) synthesis or through an active metabolite influencing cannabinoid receptors. ADR Jaundice, Abdominal pain Dose Paediatric:10-15 mg/kg Adult: 650mg.

ii. ERYTHROMYCIN

Mechanism of action

Erythromycin acts by inhibition of protein synthesis by binding to the 23S ribosomal RNA molecule in the 50S subunit of ribosomes in susceptible bacterial organisms. It stops bacterial protein synthesis by inhibiting the transpeptidation/translocation step of protein synthesis. [6] ADR

Allergic reaction, Diarrhoea Dose Paediatric: 30 mg/kg/day Adult:500 mg

iii. ZANAMIVIR & OSELTAMIVIR

Mechanism of action

Zanamivir and oseltamivir inhibit viral neuraminidase, an enzyme essential for release of newly formed virus particles from infected cells and further spread of the infectious virus.^[7,8]

ADR

Diarrhoea, Bronchospasm Dose Paediatric:30 mg BD Adult: 75mg OD

1.2.1.2. CHRONIC BRONCHITIS

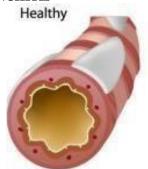




Figure 1.2.1.2: Chronic Bronchitis.^[9]

EPIDEMIOLOGY

- Chronic bronchitis is a non specific disease that primarily affects adults.
- Between 10% and 25% of the adult population, 40 years of age or older suffer from Chronic Bronchitis.
 This disease is so common that Acute Bronchitis and acute exacerbations of Chronic Bronchitis results in more physician visits.
- It occurs more commonly in men than in women. [10,11]

ETIOLOGY

- ➤ Several contributing factors: The most important etiological factors responsible for majority of cases of Chronic Bronchitis are.
- Cigarette smoking
- Exposure to occupational dust
- Fumes

- Environmental pollution
- Bacterial and viral infection^[11]

PATHOGENESIS

- The chronic inhalation of an irritating noxious substance compromises the normal secretory and mucociliary function of bronchial mucosa.
- Bronchial biopsy specimens in Bronchitis patients underscore the importance of proinflammatory cytokines(interleukins 1, 6 and 8 and Tumor Necrosis Factor-Alpha).
- In Chronic Bronchitis the bronchial wall is thickened and the number of mucus-secreting goblet cells in the surface epithelium of both larger and smaller bronchi is markedly increased.
- Goblet cells re generally absent from the smaller bronchi of normal individuals. In addition to the increased number of goblet cells, hypertrophy of the

mucous in their peripheral airways, further impairing normal lung defences. This increased quantity of tenacious secretions within the bronchial tree frequently causes mucous plugging of the smaller airways.

- These changes are squamous cell metaplasia of the surface epithelium, edema and increased vascularity of the basement membrane of larger airways and variable chronic inflammatory cell infiltration.
- Chronic Bronchitis have more mucus in their peripheral airways, further impairing normal lung defences and this will causes mucous plugging of the smaller airways.
- Continued progression of disease can result in residual scarring of small bronchi, augmenting airway obstruction and weakening of bronchial walls
- The pathology of Chronic Bronchitis includes an inflammatory mononuclear cell infiltrate in the

- airway wall and a neutrophil influx into the airway lumen.
- The molecular events that produce the inflammation and its pathogenetic role in causing mucus hypersecretion are beginning to be elucidated.
- The inflammatory cell recruitment to the airways likely involves chemotactic agents derived not only from tissue fluid and invading microbes but also generated by the diseased bronchial epithelium. For example, bronchial epithelial cells synthesize interleukin (IL-8), a potent chemoattractant and activator of neutrophils and lymphocytes.
- Adhesion of infiltrating leukocytes to resident parenchymal cells in the bronchi and to extracellular matrix also is crucial for the development of airway inflammation. [13]

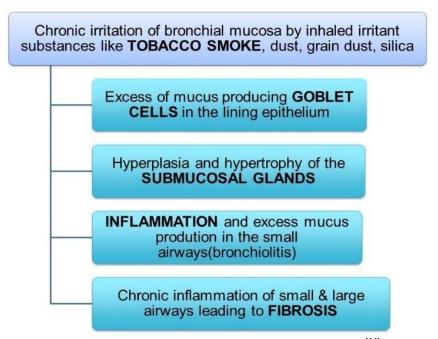


Figure 1.2.1.3: Pathophysiology of Chronic Bronchitis. [14]

CLINICAL PRESENTATION[13,14]

- Cough
- Sputum can vary in colour from white to yellowgreen.
- Coryza
- Diarrhoea
- Noisy breathing
- Nasal flaring
- Grunting

DIAGNOSIS

- Sputum culture
- Gram staining
- Radiographic studies
- Chest auscultation
- Pulmonary function test^[13]

TREATMENT NON PHARMACOLOGICAL TREATMENT^[14]

 Humidification of inspired air may promote the hydration of tenacious secretion allowing of more productive removal.

PHARMACOLOGICAL TREATMENT^[15] i. AMPICILLIN

Mechanism of action

The mechanisms of action of ampicillin are interference with cell wall synthesis by attachment to Penicillin-Binding Proteins (PBPs), inhibition of cell wall peptidoglycan synthesis and inactivation of inhibitors to autolytic enzymes.

ADR

Stomach pain, Fever Dose Adult dose:0.5 -1 g

ii. TETRACYCLINE

Mechanism of action

It works by suppression of protein synthesis by reversible binding to the 30S ribosomal subunit which results in blocking the attachment of transfer RNA to the messenger RNA ribosomal complex.

ADR

Loss of appetite, Sore throat Dose Adult dose: 0.5g

iii. TRIMETHOPRIM -SULFAMETHOXAZOLE

Mechanism of action

Sulfamethoxazole is a sulfonamide (antimicrobial drug class) that works directly on the synthesis of folate inside microbial organisms, e.g., bacteria. Sulfamethoxazole achieves this directly as a competitor of p-aminobenzoic acid (PABA) during the synthesis of dihydrofolate via inhibition of the enzyme dihydropteroate synthase. Trimethoprim is a direct competitor of the enzyme dihydrofolate reductase, resulting in its inhibition, which

halts the production of tetrahydrofolate to its active form of folate. The combination of these two agents is meant to create a synergistic anti-folate effect; tetrahydrofolate is a necessary component for synthesizing purines required for DNA and protein production. When used alone, these drugs only act in a bacteriostatic manner. However, when used in the combination of sulfamethoxazole-trimethoprim, they block two steps in the bacterial biosynthesis of essential nucleic acids and proteins, thus can be bactericidal. [15]

ADR

Confusion, Headache Dose Adult: 1 dose (160 mg + 800mg)

1.2.2. BRONCHIOLITIS

Bronchiolitis is an acute viral infection of the lower respiratory tract of the infants that affects approximately 50% of children during the first year of life and 100% by 3 years. [16]

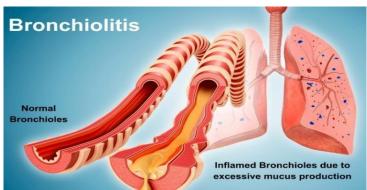


Figure 1.2.2: Bronchiolitis. [17]

EPIDEMIOLOGY

Bronchiolitis is an acute viral infection of the lower respiratory tract that affects approximately50% of children during the first year of life and 100% by age 3 years. The occurance of bronchiolitis peaks during the winter months and persists through early spring. Bronchiolitis remain the major reason for hospital admission during the first year of life. The incidence of bronchiolitis appears to be more common in males than in females. [17,20]

ETIOLOGY

- Respiratory Syncytial Virus is the most common cause of Bronchiolitis, accounting for up to 70% of all cases.
- During the epidemic periods, the incidence of RSV induced Bronchiolitis can exceed 80% of cases.
- Parainfluenza viruses are the second most common

cause.

 Bacteria serve as secondary pathogens in only a small minority of cases. [17,19]

PATHOGENESIS

Bronchiolitis primarily affects the lower respiratory tract, particularly the small airways called bronchioles. It starts with the invasion of a virus, most commonly Respiratory Syncytial Virus into the epithelial cells lining the bronchioles. This viral infection triggers an inflammatory response, leading to swelling and narrowing of the airways. Additionally, the body's immune response results in increased mucous production, further obstructing the air passages. These changes make it difficult for air to move freely in and out of the lungs, leading to symptoms such as coughing, wheezing and breathlessness. In severe cases bronchiolitis can cause respiratory distress. [21]

260

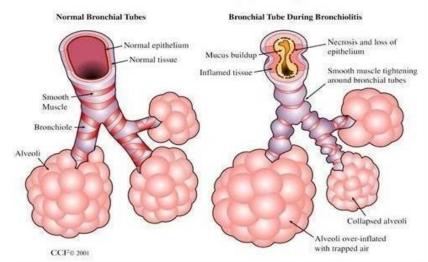


Figure 1.2.2.1: Pathophysiology of Bronchiolitis. [22]

CLINICAL PRESENTATION

- Prodrome with irritability
- Restlessness
- Mild fever
- Cough
- Coryza
- Vomiting
- Diarrhoea
- Noisy breathing
- Nasal flaring and grunting^[17]

DIAGNOSIS

- Chest Xray
- Complete blood count
- Viral culture^[17]

TREATMENT^[23] NON PHARMACOLOGICAL TREATMENT

- Encourage fluids
- Avoid exposure to smoking

PHARMACOLOGICAL TREATMENT^[24]

RIBAVIRIN

Mechanism of action

Ribavirin is reported to have several mechanism of actions that lead to inhibition of viral RNA and protein synthesis. After activation by adenosine kinase to ribavirin mono-, di-, and triphosphate metabolites. Ribavirin triphosphate (RTP) is the predominant metabolite which directly inhibits viral mRNA polymerase by binding to the nucleotide binding site of the enzyme .This prevents the binding of the correct nucleotides, leading to a reduction in viral replication or to the production of defective virions. [22]

ADR

Stomach upset, Cough Dose Adult: 1 - 1.2 g /day

1.2.3. PNEUMONIA

Pneumonia is an acute inflammation of the pulmonary parenchyma triggered by diverse microorganisms such as bacteria, viruses, fungi and parasites. [25]

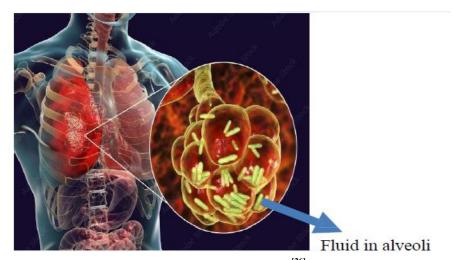


Figure 1.2.3: Pneumonia. [26]

EPIDEMIOLOGY

- Pneumonia is the most common infectious cause of death in the United State
- It occurs in persons of all ages. [27,28]

ETIOLOGY

- Bacteria -Streptococcus pneumonia, Staphylococcus pneumonia, Klebseilla pneumonia
- Virus- Adenovirus, Influenza virus, Parainfluenza virus.^[27,29]

PATHOGENESIS

- Microorganisms gain access to the lower respiratory tract by three routes. They may be inhaled as aerosolized particles or they may enter the lung via the bloodstream from an extrapulmonary site of infection; however, aspiration of oropharyngeal contents, a common occurrence in both healthy and ill persons during sleep, is the major mechanism by which pulmonary pathogens enter.
- Lung infections with viruses suppress the bacterial clearing activity of the lung by impairing alveolar macrophage function and mucociliary clearance, thus setting the stage for secondary bacterial pneumonia.

- The vast majority of Pneumonia cases acquired in the community by otherwise healthy adults are due to S. pneumoniae. Other common bacterial causes include M. pneumoniae, Legionella and C. pneumoniae which are referred to as atypical pathogens. [26] Community acquired pneumonias caused by Staphylococcus aureus and gram negative rods are observed primarily in the elderly, especially those residing in nursing homes, and in association with alcoholism and other debilitating conditions. [28]
- Gram-negative aerobic bacilli and S.aureus are also the leading causative agents in hospital-acquired pneumonia.^[29]
- Anaerobic bacteria are the most common ethiologic agents in pneumonia that follows the gross aspiration of gastric or oropharyngeal contents.
- In the paediatric age group, most pneumonias are due to viruses, especially Respiratory Syncytial Virus, Parainfluenza & Adenovirus. Pneumococcus is the most common bacterial cause, followed by group A Streptococcus and S.aureus.

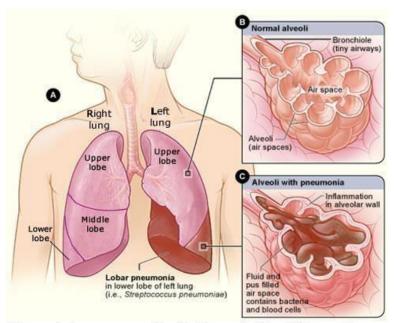


Figure A shows pneumonia affecting part of the left lower lobe. Figure B shows healthy alveoli (air sacs). Figure C shows alveoli

Figure 1.2.3.1: Pathophysiology of Pneumonia. [30]

CLINICAL PRESENTATION[31]

- Abrupt onset of fever
- Chills
- Dyspnea
- Productive cough
- Rust colored sputum or hemoptysis
- Pleuritic chest pain

TYPES OF PNEUMONIA[32]

1. ANAEROBIC PNEUMONIA

The course of Anaerobic Pneumonia is typically associated with cough, low grade fever and weight loss, although an acute presentation may occur. Putrid sputum, when present, is highly suggestive of the diagnosis. Chest radiographs reveal infiltrates typically located in dependent lung segments, and lung abscesses develop in 20% of patients 1-2 weeks

- into the course of the illness.
- Mycoplasma pneumoniae Pneumonia presents with a
 gradual onset of fever, headache and malaise with the
 appearance 3-5 days after the onset of illness of a
 persistent, hacking cough that initially is non
 productive. Sorethroat, ear pain and rhinorrhea are
 often present. Lung finding are generally limited to
 rales and rhonchi; findings of consolidation are
 rarely present.
- Non pulmonary manifestations are extremely common and include nausea, vomiting, diarrhoea, myalgias, arthralgias, polyarticular arthritis, skin rashes, myocarditis & pericarditis, hemolytic anemia, meningoencephalitis, cranial neuropathies and Guillain-Barre syndrome. Systemic symptoms generally clear in 1-2 weeks, whereas respiratory symptoms may persist upto 4 weeks.

2. NON BACTERIAL PNEUMONIA

A. MYCOPLASMA PNEUMONIA

- Mycoplasma pneumonia causes human disease throughout the year, with a slightly increased incidence in fall and early winter.
- Mycoplasma pneumonia infections are unusual in children younger than 5 years and show a peak incidence in older children and young adults.

3. VIRAL PNEUMONIA

The clinical pictures produced by respiratory viruses are sufficiently variable and overlap to such a degree that an etiologic diagnosis cannot confidently be made on clinical grounds alone. Serologic tests for virus specific antibodies are often used in the diagnosis of viral infections. The diagnostic fourfold rise in titer between acute and convalescent phase sera may require 2-3 weeks to develop; however, same-day diagnosis of viral infections is now possible through of indirect the use immunofluorescence tests on exfoliated cells from the respiratory tract.

4. NOSOCOMIAL PNEUMONIA^[33]

- The strongest predisposing factor for nosocomial pneumonia is mechanical ventilation. Risk is increased by prior antibiotic use, use of H2 receptor antagonist and severe illness.
- Subclinical microaspirations are events that occur routinely in intubated patients and result in the inoculation of bacteria-contaminated gastric contents into the lung and a higher incidence of nosocomial pneumonia.
- The organisms commonly associated with nosocomial pneumonia are Salmonella aureus and enteric and nonenteric gram negative bacilli, organisms that colonise the pharynx.
- The diagnosis of nosocomial pneumonia is usually established by presence of a new infiltrate on chest radiograph, fever, worsening respiratory status and the appearance of thick, neutrophil-laden respiratory

- secretions.
- Broad spectrum antibiotics frequently are started empirically even in equivocal circumstances, with bronchoscopy reserved for poorly responsive patients.

5. COMMUNITY ACQUIRED PNEUMONIA

- Community Acquired Pneumonia is one of the most common serious infective disease, accounting for nearly 1% of all medical admissions.^[34]
- The most common causative agent is Streptococcus pneumoniae, which is responsible for almost 50% of cases, 5 other common causes are respiratory viruses (mainly influenza A) and the atypical bacteria Chlamydophila pneumoniae and Mycoplasma pneumoniae. Less common bacterial causes are Haemophilus influenzae, Staphylococcus aureus, Moraxella catarrhalis and Legionella pneumophila.
- Microorganisms causing CAP reach the lungs either by inhalation of droplets created by sneezing or coughing from an infected contact (Respiratory viruses, C. pneumophila and M. pneumoniae), environmental source (L. pneumophila) or by microaspiration after colonisation of the nasopharynx with a potential pathogen (example, S. pneumoniae, H. influenzae or S. aureus)^[35]
- Consolidation is visible on the chest radiograph in over 90% of patients. [36]
- Combination of Macrolides and Beta lactam are given for the treatment of CAP. Macrolides have significant anti-inflammatory effects, which has been exploited for their long-term use in bronchiectasis and cystic fibrosis, and might be beneficial in CAP.^[37]

6. HOSPITAL ACQUIRED PNEUMONIA

- Hospital acquired pneumonia (HAP) is defined as pneumonia that occurs 48 hours or longer after hospital admission and excludes any infection that is incubating at the time of admission. It is also commonly termed nosocomial pneumonia.^[38]
- Early-onset HAP is commonly defined as occurring within four days of hospitalisation, with Streptococcus pneumoniae, Haemophilus influenzae and Staphylococcus aureus the most frequently isolated organisms.
- Late-onset HAP, occurring five or more days after hospitalisation, is caused by pathogens such as enteric Gram-negative bacilli that have replaced the 'community' pathogens in the oropharynx. [39,40]
- Aspiration of bacteria that colonise the of upper respiratory tract is the main route of infection. Although aspiration is common in healthy people during sleep (46%), factors that promote aspiration, such as impaired level of consciousness, supine position and placement of a nasogastric or endotracheal tube, increase the risk of HAP.
- Diagnosis and assessment of severity of HAP includes: Total blood count, electrolytes, CRP, chest X-ray, assessment of oxygenation by pulse oximetry

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or arterial blood gases.[42]

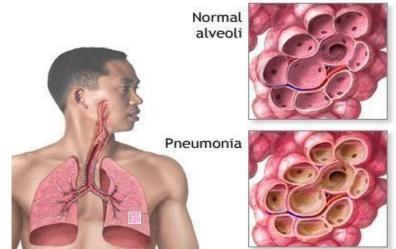


Figure 1.2.3.2: Difference between normal alveoli and pneumonia affected alveoli. [43]

DIAGNOSIS

- Chest radiograph
- Open lung biopsy
- Culture test
- Fluoroscent antibody examination of respiratory tract secretions

TREATMENT^[44] NON-PHARMACOLOGICAL TREATMENT

- Humidified oxygen for hypoxia
- Adequate hydration by IV if necessary
- Vaccination against S. Pneumoniae and H. Influenza

PHARMACOLOGICAL TREATMENT

- I. MACROLIDE ANTIBIOTICS
- 1. CLARITHROMYCIN

Mechanism of action

Clarithromycin belongs to the 14 membered macrolide antibiotic. The antibacterial effect of Clarithromycin is related to its capacity to inhibit protein synthesis in bacteria by binding to subunit 50s of the bacterial ribosome.

ADR

Insomina, Headache Dose

Paediatric:15 mg/kg/day Adult: 0.5g-1 g/day

1. AZITHROMYCIN

Mechanism of action

Azithromycin is a semisynthetic derivative of Erythromycin that inhibits bacterial protein synthesis by binding the 50s ribosomal subunit.

ADR

Chest pain, Confusion Dose

Paediatric: 10 mg/kg for 1 day, 5 mg/kg/day for 4 days Adult: 500 mg/day for 1day, 250 mg/day for 4 days

II. PENICILLIN ANTIBIOTICS

1. AMOXICILLIN + CLAVULANTE

Mechanism of action

Amoxicillin is in the class of medications called Penicillin like antibiotics. It works by stopping the growth of bacteria. Clavulanic acid is in class pf medications called beta- lactamase inhibitors. It works by preventing bacteria from destroying Amoxicillin.

ADR

Rash, itching Dose

Paediatric: 40-90 mg/kg/day Adult: 0.75- 1g /day

2. PIPERACILLIN+TAZOBACTAM

Mechanism of action

Tazobactam inhibits beta-lactamase and prevents the destruction of piperacillin. Therefore, Tazobactam is given with Piperacillin to enhance the activity of Piperacillin in eradicating bacterial infections. Piperacillin kills bacteria by inhibiting the synthesis of bacterial cell walls.

ADR

Diarrhoea, headache Dose

Paediatric:200-300 mg/kg/day Adult: 12g/day

III. CEPHALOSPORIN ANTIBIOTICS

1. CEFTRIAXONE

Mechanism of action

Ceftriaxone works by inhibiting the mucopeptide synthesis in the bacterial cell wall. The beta-lactam moiety of ceftriaxone binds to carboxypeptidases, endopeptidases, and transpeptidases in the bacterial cytoplasmic membrane. These enzymes are involved in cell-wall synthesis and cell division.

ADR

Trouble swallowing, Itching Dose Paediatric:50-75 mg/kg/day Adult: 1- 2g/day

2. CEFEPIME

Mechanism of action

Cefepime inhibits bacterial cell wall synthesis by covalently binding enzymes responsible for the final step in transpeptidation during peptidoglycan wall synthesis. This binding causes defects in the cell wall leading to

264

autolysis and subsequent death of the organism. ADR Abdominal cramps, back pain Dose Paediatric:100-150 mg/kg/day Adult: 2-4g/day

V. QUINIDINE

1. LEVOFLOXACIN

Mechanism of action

Levofloxacin belongs to the class of medicines known as quinolone antibiotics. It works by killing bacteria or preventing their growth.

ADR

Dizziness, headache Dose adult:0.5-0.75g/day

METHODOLOGY

4.1 DESIGN OF THE STUDY

Prospective Observational Study.

4.2 DURATION OF THE STUDY

6 months duration after getting approval from the Institutional Ethics Committee.

4.3 STUDY SETTINGS

Department of Pulmonary, Critical Care and Sleep Medicine

Cosmopolitan Hospital Post Graduate Institute of Health Science and Research Thiruvananthapuram, Kerala.

4.4 STUDY POPULATION

Those patients admitted in the Pulmonary, Critical Care and Sleep Medicine Department during the period of 2023-2024 and those who satisfy the inclusion and exclusion criteria.

4.5 CRITERIA FOR ELIGIBILITY 4.5.1 INCLUSION CRITERIA

 All In-patients and Out-patients from Pulmonary, Critical Care and Sleep Medicine Department were included.

4.5.2 EXCLUSION CRITERIA

- Patients who were not willing to participate in the study were excluded.
- Psychiatric patients were exclude.

SAMPLE SIZE

The sample size of the prospective study is calculated by the following formula

Sample size,
$$n = \frac{2}{d2} \alpha Z P(1-P)$$

 α - Level of significance

P - Prevalence of Lower Respiratory Tract Infection

d -Margin of error/precision of the study

From the previous literature it is found that prevalence of LRTI was 30% with a confidence level of 95% and a margin of error of 9%, then

Za - 5% Level of significance = 1.96

P - Prevalence of LRTI = 30%

1-P - 70%

d- Margin of error = 9%

Sample size, $n = (1.96)2 \times 0.30 \times 0.70 = 100$ (0.09)2

STUDY PROCEDURE

- Six months study was conducted after getting approval of Institutional Ethics Committee.
- All patients who fulfil the inclusion criteria was selected for the study.
- Data collecting form was used for recording all relevant informations of Lower Respiratory Tract Infection patients undergoing treatment.
- Data was collected only after getting informed consent from the patients.
- Prevalence of Lower Respiratory Tract Infections assessed in paediatric, adult and geriatric patients as well as in both male and female patients.
- Prescriptions were studied to analyse the antibiotic prescribing patterns in Lower Respiratory Tract Infections patients.
- Health related Quality of Life was assessed using SF-36 questionnaire before and after patient counselling to analyse its impact on patient outcome and the follow up was taken after 2 weeks.

4.6 STATISTICAL ANALYSIS

- Statistical analysis was performed using Microsoft Excel.
- Paired t-test was used to compare the Quality of Life of Lower Respiratory Tract Infection patients before and after patient counselling and treatment.
- The P value < 0.05 was considered as statistically significant.

4.7 DATA COLLECTION TOOL

- Pre designed Data Collection Form
- Informed Consent form
- Patient Information Sheet
- SF-36 questionnaire
- Patient Information Leaflet

5. RESULTS AND DISCUSSION5.1. RESULTS

As per the study criteria 100 patients were enrolled into the study from the Pulmonary, Critical Care and Sleep Medicine Department in Cosmopolitan Hospital Post Graduate Institute of Health Sciences and Research, Thiruvananthapuram.

5.1.1. AGE WISE DISTRIBUTION OF THE STUDY POPULATION

Table 5.1.1: Age-wise distribution of the study population.

Age in years	Number of patients (n=100)	Percentage (%)
Below 18 years (Paediatrics)	48	48%
19-59 years (Adults)	31	31%
Above 60 years (Geraitrics)	21	21%
Total	100	100%

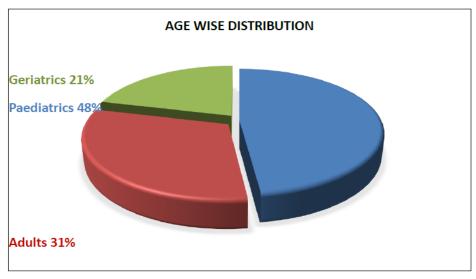


Figure 5.1.1: Age-wise distribution of the study population.

Among the patients screened, the age distribution data shows 48% of patients were from paediatric population (below 18 years) followed by 31% from adult population

(19-59 years) and 21% from geriatric population (above 60 years).

5.1.2. GENDER WISE DISTRIBUTION OF THE STUDY POPULATION

Table 5.1.2: Gender-wise distribution of the study population.

Gender	Number of patients (n=100)	Percentage (%)
Males	65	65%
Females	35	35%
Total	100	100%

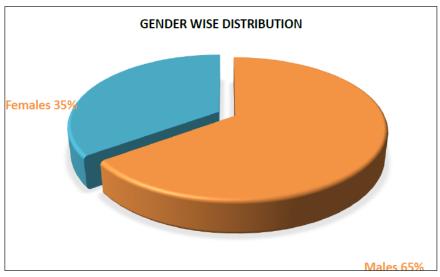


Figure 5.1.2: Gender-wise distribution of the study population.

Among the patients screened, the gender distribution data shows that 65% of them were males and 35% of

them were females.

5.1.3. PREVALENCE OF LRTI

Table 5.1.3.1: Distribution of RTIs in the study population.

Respiratory Tract Infections	Number of patients (n=100)	Percentage (%)	
LRTI	72	72%	
URTI	28	28%	
Total	100	100%	

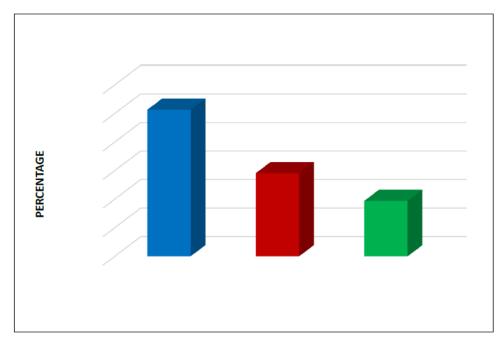
Graph 5.1.3.1: Distribution of RTIs in the study population

Among the 100 patients screened, 72% of them were diagnosed with Lower Respiratory Tract Infection and

28% of them were diagnosed with Upper Respiratory Tract Infection. Therefore the most prevalent disease was found to be LRTI.

Table 5.1.3.2: Disease-wise distribution of LRTIs in the study population.

Disease	Number of patients (n=72)	Percentage (%)	
Bronchitis	37	51.3%	
Bronchiolitis	21	29.1%	
Pneumonia	14	19.4%	
Total	72	100%	



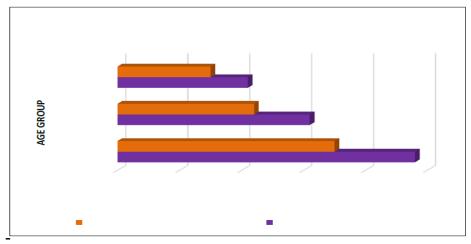
Graph 5.1.3.2: Disease-wise distribution of LRTIs.

Among the patients screened, the disease distribution data shows that 51.3% of patients were affected by

Bronchitis followed by 29.1% of them affected by bronchiolitis and 19.4% of them affected by pneumonia.

Table 5.1.3.3: Prevalence of LRTI in different age groups.

Age Groups	Total number of patients (n=100)	Number of patients with LRTI	Percentage (%)
Paediatric	48	35	73%
Adult	31	22	71%
Geriatric	21	15	71%
Total	100	72	72%



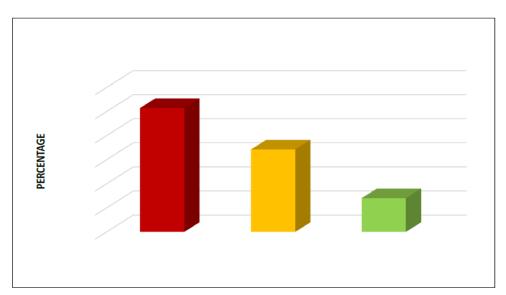
Graph 5.1.3.3: Prevalence of LRTI in different age groups.

Out of 48 paediatric patients, 35 of them were affected by LRTI (73%). Out of 31 adult patients, 22 of them

were affected by LRTI (71%). Out of 21 geriatric patients, 15 of them were affected by LRTI (71%).

Table 5.1.3.4: Disease wise distribution of LRTI in Paediatrics.

Disease	Number of patients	Percentage	
	(n=35)	(%)	
Bronchitis	18	51.4%	
Bronchiolitis	12	34.2%	
Pneumonia	5	14%	
Total	35	100%	



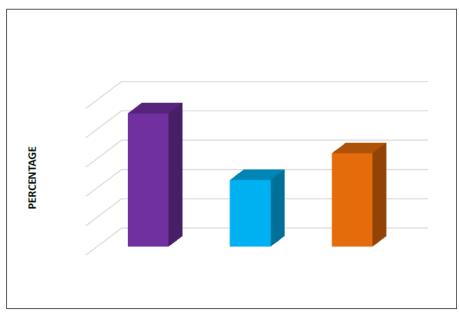
Graph 5.1.3.4: Disease wise distribution of LRTI in Paediatrics.

Among the paediatric population, 51.4% of them were affected by bronchitis, 34.2% of them were affected by

bronchiolitis and 14% of them were affected by pneumonia.

Table 5.1.3.5: Disease wise distribution of LRTI in Adults.

Disease	Number of patients (n=22)	Percentage (%)	
Bronchitis	10	45.4%	
Bronchiolitis	5	22.7%	
Pneumonia	7	31.8%	
Total	22	100%	



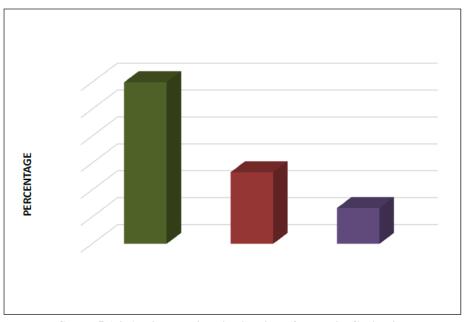
Graph 5.1.3.5: Disease wise distribution of LRTI in Adults.

Among the adult population, 45.4% of them were affected by bronchitis, 31.8% of them were affected by

pneumonia and 22.7% of them were affected by bronchiolitis.

Table 5.1.3.6: Disease wise distribution of LRTI in Geriatrics.

Disease	Number of patients	Percentage	
(n=15)		(%)	
Bronchitis	9	60%	
Bronchiolitis	4	26.6%	
Pneumonia	2	13.3%	
Total	15	100%	

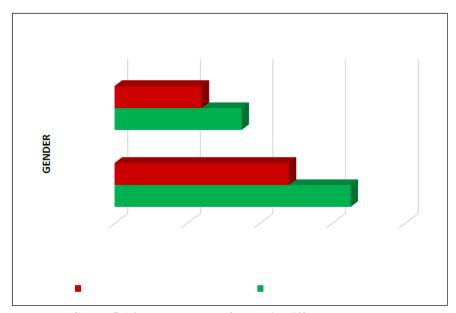


Graph 5.1.3.6: Disease wise distribution of LRTI in Geriatrics.

Among the geriatric population, 60% of them were affected by bronchitis, 26.6% of them were affected by bronchiolitis and 13.3% of them were affected by pneumonia.

Table 5.1.3.7: Prevalence of LRTI in different genders.

•	c of Entit in unit time genutiff.						
	Gender Total number of patients (n=100)		Number of patients with LRTI	Percentage (%)			
	Males	65	48	74%			
	Females	35	24	69%			
	Total	100	72	72%			



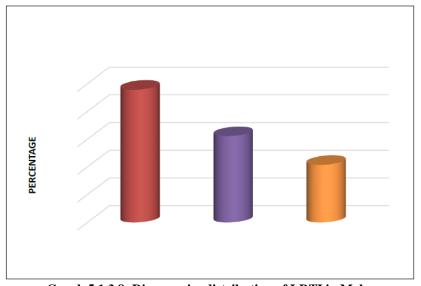
Graph 5.1.3.7: Prevalence of LRTI in different genders.

Out of 65 male patients, 48 of them were affected by LRTI (74%) and out of 35 female patients, 24 of them

were affected by LRTI (69%).

Table 5.1.3.8: Disease wise distribution of LRTI in Males.

Disease	Number of patients	Percentage
	(n=48)	(%)
Bronchitis	23	47.9%
Bronchiolitis	15	31.2%
Pneumonia	10	20.8%
Total	48	100%

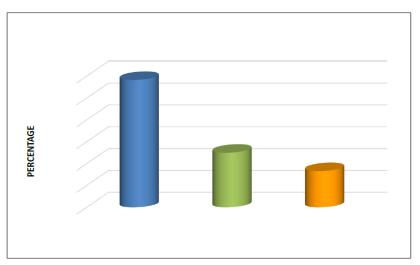


Graph 5.1.3.8: Disease wise distribution of LRTI in Males.

Among males, 47.9% of them were affected by and 20.8% of them were affected by pneumonia. bronchitis, 31.2% of them were affected by bronchiolitis

Table 5.1.3.9: Disease wise distribution of LRTI in Females.

Disease	Number of patients (n=24)	Percentage (%)	
Bronchitis	14	58.3%	
Bronchiolitis	6	25%	
Pneumonia	4	16.6%	
Total	24	100%	



Graph 5.1.3.9: Disease wise distribution of LRTI in Females.

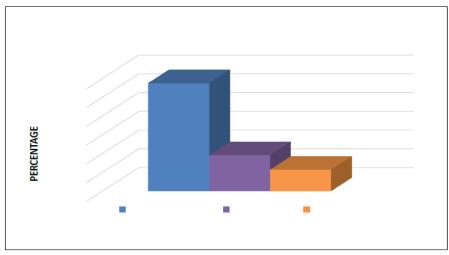
Among females, 58.3% of them were affected by bronchitis 25% of them were affected by bronchiolitis

and 16.6% were affected by pneumonia.

5.1.4. ANTIBIOTIC PRESCRIBING PATTERN IN LRTI

Table 5.1.4.1: Antibiotic prescribing pattern in Paediatrics.

Class	Antibiotics	Bronchitis	Bronchiolitis	Pneumonia	Total	Percentage
	Cefuroxime	7	2	2	11	
Cephalosporin	Cefoperazone Sulbactam	2	3	1	6	62.1%
	Ceftriaxone	2	2	2	6	
Macrolide	Clarithromycin	1	1	4	6	21.60/
Macronde	Azithromycin	1	1	0	2	21.6%
Penicillin	Amoxicillin Clavulanic Acid	1	1	2	4	16.2%
	Piperacillin Tazobactam	1	0	1	2	



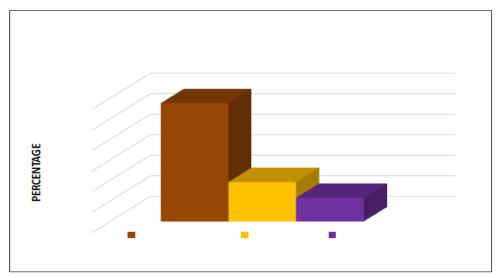
Graph 5.1.4.1: Antibiotic prescribing pattern in Paediatrics.

Among the prescriptions of paediatric patients, the most commonly prescribed antibiotics were Cephalosporin (62.1%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide (21.6%)

(Clarithromycin and Azithromycin) and Penicillin (16.2%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam).

Table 5.1.4.2: Antibiotic prescribing pattern in Adults.

Class	Antibiotics	Bronchitis	Bronchiolitis	Pneumonia	Total	Percentage
	Cefuroxime	2	1	1	4	
Cephalosporin	Cefoperazone Sulbactam	4	1	3	8	58.6%
	Ceftriaxone	3	1	1	5	
Macrolide	Clarithromycin	2	0	3	5	24.1%
Macronde	Azithromycin	0	0	2	2	24.1%
Penicillin	Amoxicillin Clavulanic Acid	0	1	1	2	17.2%
	Piperacillin Tazobactam	1	2	0	3	



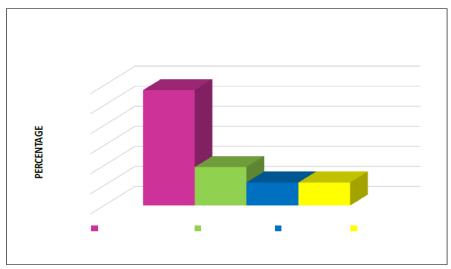
Graph 5.1.4.2: Antibiotic prescribing pattern in Adults.

Among the prescriptions of adult patients, the most commonly prescribed antibiotics were Cephalosporin (58.6%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide (24.1%)

(Clarithromycin and Azithromycin) and Penicillin (17.2%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam).

Table 5.1.4.3: Antibiotic prescribing pattern in Geriatrics.

Class	Antibiotics	Bronchitis	Bronchiolitis	Pneumonia	Total	Percentage	
	Cefuroxime	5	3	1	9		
Cephalosporin	Cefoperazone Sulbactam	2	1	1	4	57.6%	
	Ceftriaxone	1	1	0	2		
Macrolide	Clarithromycin	1	1	2	4	10.20/	
Macronde	Azithromycin	0	0	1	1	19.2%	
Penicillin	Amoxicillin Clavulanic Acid	1	0	1	2	11.5%	
Piperacillin Tazoba		0	1	0	1		
Carbapenem	Meropenem	0	2	1	3	11.5%	



Graph 5.1.4.3: Antibiotic prescribing pattern in Geriatrics.

Among the prescriptions of geriatric patients, the most commonly prescribed antibiotics were Cephalosporin (57.6%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide (19.2%) (Clarithromycin and Azithromycin), Penicillin (11.5%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam) and Carbapenem (11.5%) (Meropenem).

5.1.5. QUALITY OF LIFE

Health related Quality of Life OF LRTI patients were assessed using SF-36 Questionnaire. This survey

encompasses 36 questions that measure 8 key dimensions of health: physical functioning, role limitations due to physical health, bodily pain, general health perceptions, vitality, social functioning, role limitations due to emotional problems and mental health. Scoring involved calculating scores for each of its 8 domains and each domain is scored on a scale 0 to 100 with higher scored indicating better health and quality of life.

Table 5.1.5.1: Comparison of physical function before and after therapy and counseling.

Physical Functioning	Before	After
Mean percentage Score	24%	78%
SD	8.4	9.1
Significant value	0.001*(p<0.05)

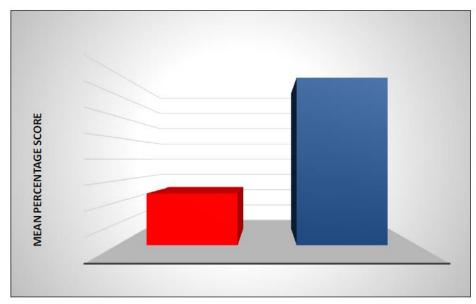


Figure 5.1.5.1: Diagrammatic representation of comparison of physical function before and after therapy and counseling.

When comparing physical functioning, the percentage score was 24% before counselling and 78% after counselling. The results were significant, indicating that

the physical functioning percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.2: Comparison of role limitation due to physical health before and after therapy and counseling.

Physical Health	Before	After
Mean percentage Score	23%	77%
SD	22.3	15.7
Significant value	0.001*(p<0.05)

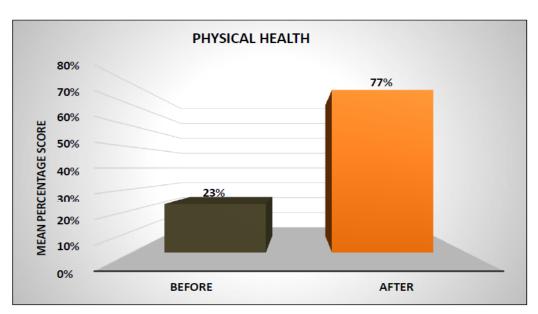


Figure 5.1.5.2: Diagrammatic representation of comparison of role limitation due to physical health before and after therapy and counseling.

When comparing role limitation due to physical health, the percentage score was 23% before counselling and 77% after counselling. The results were significant, indicating that the role limitation due to physical health percentage score significantly increased after therapy and

counselling compared to before therapy and counselling.

Table 5.1.5.3: Comparison of role limitation due to emotional problem before and after therapy and counseling.

Emotional Problem	Before	After
Mean percentage Score	22.21%	82%
SD	20.1	16.7
Significant value	0.001* (p<0.05)	

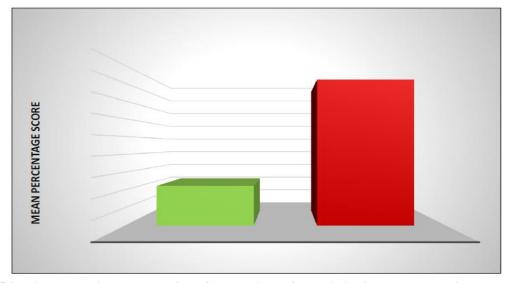


Figure 5.1.5.3: Diagrammatic representation of comparison of role limitation due to emotional problem before and after therapy and counseling.

When comparing role limitation due to emotional problem, the percentage score was 22.21% before counselling and 82% after counselling. The results were significant, indicating that the role limitation due to

emotional problem percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.4: Comparison of energy/fatigue problem before and after therapy and counseling.

Energy/Fatigue	Before	After
Mean percentage Score	15%	84%
SD	8.2	12.4
Significant value	0.001*(p<0.05)

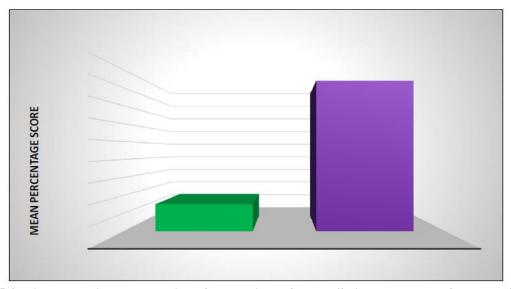


Figure 5.1.5.4: Diagrammatic representation of comparison of energy/fatigue problem before and after therapy and counseling.

www.wjpmr.com Vol 11, Issue 10, 2025. ISO 9001:2015 Certified Journal 275

When comparing energy/fatigue, the percentage score was 23% before counselling and 77% after counselling. The results were significant, indicating that the

energy/fatigue percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.5: Comparison of emotional well-being problem before and after therapy and counseling.

Emotional Well-Being	Before	After
Mean percentage Score	24%	84%
SD	9.3	15.2
Significant value	0.001* (1	0.05)

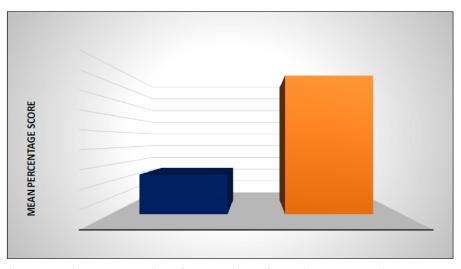


Figure 5.1.5.5: Diagrammatic representation of comparison of emotional well- being problem before and after therapy and counseling.

When comparing emotional well-being, the percentage score was 24% before counselling and 84% after counselling. The results were significant, indicating that

the emotional well-being percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.6: Comparison of social functioning problem before and after therapy and counseling.

Social Functioning	Before	After
Mean percentage Score	23%	89%
SD	12.2	11.08
Significant value	0.001* (p<0.05)

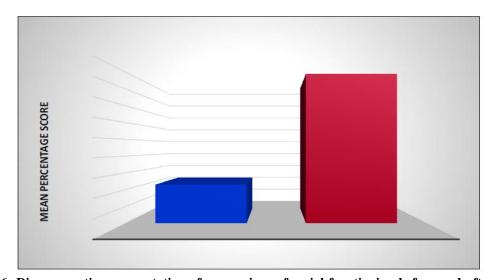


Figure 5.1.5.6: Diagrammatic representation of comparison of social functioning before and after therapy and counseling.

When comparing social functioning, the percentage score was 23% before counselling and 89% after counselling. The results were significant, indicating that the social

functioning percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.7: Comparison of pain score before and after therapy and counseling.

Pain Score	Before	After
Mean percentage Score	27%	83.7%
SD	15.5	14.8
Significant value	0.001*(p<0.05)

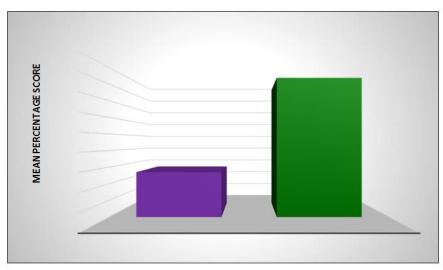


Figure 5.1.5.7: Diagrammatic representation of comparison of pain score before and after therapy and counseling.

When comparing pain score, the percentage score was 27% before counselling and 83.7% after counselling. The results were significant, indicating that the pain score

percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.8: Comparison of general health before and after therapy and counseling.

General Health	Before	After
Mean percentage Score	25%	85%
SD	11.3	11.4
Significant value	0.001*(p<0.05)

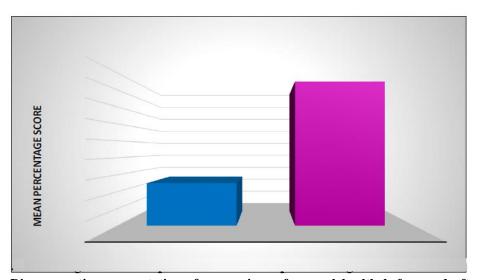


Figure 5.1.5.8: Diagrammatic representation of comparison of general health before and after therapy and counseling.

When comparing general health, the percentage score was 25% before counselling and 85% after counselling. The results were significant, indicating that the general

health percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.9: Comparison of health change before and after therapy and counseling.

Health Change	Before	After
Mean percentage Score	20%	77%
SD	9.6	11.8
Significant value	0.001* (p<0.05)

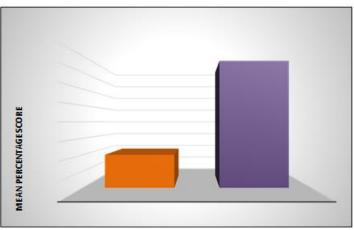


Figure 5.1.5.9: Diagrammatic representation of comparison of health change before and after therapy and counseling.

When comparing health change, the percentage score was 20% before counselling and 77% after counselling. The results were significant, indicating that the health

change percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

Table 5.1.5.10: Comparison of quality of life before and after therapy and counseling.

Domains	Before Treatment	After Treatment
	(Mean percentage Score)	(Mean percentage Score)
Physical functioning	24%	78%
Physical health	23%	77%
Emotional problem	22.21%	82%
Energy/Fatigue	15%	84%
Emotional well-being	24%	84%
Social functioning	23%	89%
Pain	27%	83.70%
General health	25%	85%
Health change	20%	77%
Overall Quality of Life	22.57%	82.18%

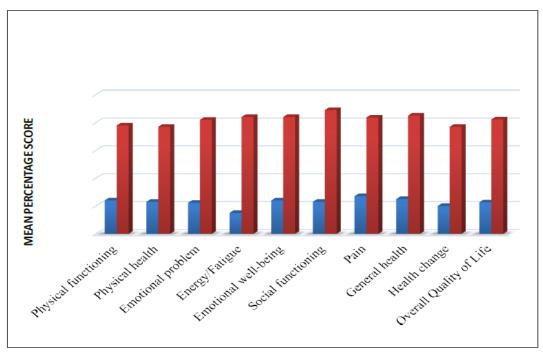


Figure 5.1.5.10: Diagrammatic representation of comparison of quality of life before and after therapy and counseling.

OVER ALL QUALITY OF LIFE

Overall quality of life was calculated by adding the percentage score of all domains. Then the before

treatment and after treatment scores were compared with a statistical test called paired t test. The result was shown below:

Table 5.1.5.11: Comparison of overall quality of life before and after therapy and counseling.

Overall Quality of Life	Before	After
Mean percentage Score	22.57%	82.18%
SD	5.14	2.61
Significant value	0.001* (p<0.05)	

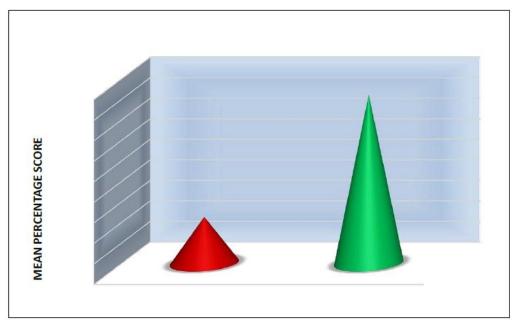


Figure 5.1.5.11: Diagrammatic representation of comparison of overall quality of life before and after therapy and counseling.

www.wjpmr.com Vol 11, Issue 10, 2025. ISO 9001:2015 Certified Journal 279

When comparing overall quality of life, the percentage score was 22.57% before counselling and 82.18% after counselling. The results were significant, indicating that the overall quality of life percentage score significantly increased after therapy and counselling compared to before therapy and counselling.

5.2. DISCUSSION

This prospective observational study was conducted in patients with Lower Respiratory Tract Infections undergoing treatment with the aim of determining prevalence. antibiotic prescribing pattern improvement in quality of life of LRTI patients. The study was carried out in the Pulmonary and Critical care Department of Cosmopolitan Hospital Post Graduate Institute of Health Sciences and Research. Thiruvananthapuram. A total of 100 patients were enrolled in this study. Prevalence of LRTI in paediatric, adult and geriatric population was studied. Proper counselling was provided to the patients and the impact was assessed. The improvement in quality of life of LRTI patients were assessed using SF-36 Questionnaire.

5.2.1. AGE

In this study, the majority of patients comes under the age group of 18 years and below (48%) followed by age group of 19-59 years (31%) and age group of 60 years and above (21%). It shows that Respiratory Tract Infection was most commonly affected to paediatric population followed by adult and geriatric population. It is similar to the study conducted by "Isha Begum et al". [52]

5.2.2. GENDER

In this study, the majority of patients were males (65%) followed by females (35%). It shows that Respiratory Tract Infection was most commonly affected to the male population than females. It is similar to the study conducted by "Alanazi et al". [63] and "Akingbade et al". [63]

5.2.3. DISEASE

In this study, the majority of patients were affected by Lower Respiratory Tract Infection (72%) followed by Upper Respiratory Tract Infection (28%). It shows that the most prevalent disease among Respiratory Tract Infections were LRTI. It is similar to the study conducted by "Isha Begum et al" [52] and "Divya Kancherla" [61].

Among LRTIs, Bronchitis was the most commonly affected disease (51.3%) followed by Bronchiolitis (29.1%) and Pneumonia (19.4%). It is similar to the study conducted by "Joshi S et al". [48]

In this study, paediatrics were mostly affected by LRTI followed by adult and geriatric population. Also males were mostly affected by LRTI than females. It is similar to the study conducted by "Sunil Vijay et al". [51] and "Shaker Salehi et al". [51]

Among the paediatric population, the most commonly affected LRTI was Bronchitis (51.4%), followed by Bronchiolitis (34.2%) and Pneumonia (14%). It is similar to the study conducted by "*Joshi et al*". [48]

Among the adult population, the most commonly affected LRTI was Bronchitis (45.4%), followed by Pneumonia (31.8%) and Bronchiolitis (22.7%).

Among the geriatric population, the most commonly affected LRTI was Bronchitis (60%), followed by Bronchiolitis (26.6%) and Pneumonia (13.3%).

Among males, the most commonly affected LRTI was Bronchitis (47.9%), followed by Bronchiolitis (31.2%) and Pneumonia (20.8%). Among females, the most commonly affected LRTI was Bronchitis (58.3%), followed by Bronchiolitis (25%) and Pneumonia (16.6%).

5.2.4. PRESCRIPTION PATTERN

In this study, antibiotics like Cefuroxime, Cefoperazone + Sulbactam, Ceftriaxone, Amoxicillin + Clavulanic acid, Piperacillin + Tazobactam, Clarithromycin, Azithromycin and Meropenem were given to the respective group of patients. The most commonly prescribed antibiotic class was Cephalosporins followed by Macrolide and Penicillins. It is similar to the study conducted by "Akingbade et al". [63]

Among the prescriptions of paediatric patients, the most commonly prescribed antibiotics were Cephalosporin (62.1%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide (21.6%) (Clarithromycin and Azithromycin) and Penicillin (16.2%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam).

Among the prescriptions of adult paitents, the most commonly prescribed antibiotics were Cephalosporin (58.6%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide (24.1%) (Clarithromycin and Azithromycin) and Penicillin (17.2%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam).

Among the prescriptions of geriatric patients, the most commonly prescribed antibiotics were Cephalosporin (57.6%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide (19.2%)(Clarithromycin and Azithromycin), Penicillin (11.5%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam) and Carbapenem (11.5%) (Meropenem). It is similar to the study conducted by "Alanazi et al" [47] and "S Suwitha et al". [55]

5.2.5. QUALITY OF LIFE

Improvement in quality of life was assessed using SF-36 questionnaire. Comparing the overall quality of life before and after treatment was assessed using a paired t-

test. Quality of Life was improved in all the eight health domains like physical functioning, role limitations due to physical health problems, role limitations due to personal/emotional problems, emotional well-being, social functioning, energy/fatigue, bodily pain, general health perceptions. The result was significant and concluded that the overall quality of life percentage score after therapy and counselling was significantly increased than before therapy and counselling. It is similar to the study conducted by "Emine Atag et al". [53]

SUMMARY AND CONCLUSION 6.1. SUMMARY

A Prospective observational study was conducted in the Department of Pulmonary, Critical care and Sleep Medicine at Cosmopolitan hospital to assess the Prevalence, Antibiotic prescribing pattern and Health related quality of life in patients with Lower Respiratory Tract Infections after getting Ethical Committee approval. The objective of the study was to identify the Prevalence, Antibiotic prescribing pattern, Health related quality of life in patients having Lower Respiratory Tract Infections and to conduct patient counselling to improve the quality of life. The selection of patient was based on inclusion and exclusion criteria. Estimated sample size was 100. Patients socio-demographic details, history and comorbidities were collected.

- A total of 100 patients satisfied inclusion criteria and male counterparts (65%) were observed to be higher than the females (35%) in the study population.
- Majority of the patient belonged to the age group of below 18 years(48%).
- Among 100 patients, 72 patients were diagnosed with LRTI (72%) and 28 were diagnosed with URTI (28%).
- Among the 72 patients screened, the disease distribution data shows that 51.3% of patients were affected by Bronchitis followed by 29.1% of them affected by Bronchiolitis and 19.4% of them affected by Pneumonia.
- Among the paediatric population, 51.4% of them were affected by Bronchitis, 34.2% of them were affected by Bronchiolitis and 14% of them were affected by Pneumonia.
- Among the adult population, 45.4% of them were affected by Bronchitis, 31.8% of them were affected by Pneumonia and 22.7% of them were affected by Bronchiolitis.
- Among the geriatric population, 60% of them were affected by Bronchitis, 26.6% of them were affected by Bronchiolitis and 13.3% of them were affected by Pneumonia.
- Among males, 47.9% of them were affected by Bronchitis, 31.2% of them were affected by Bronchiolitis and 20.8% of them were affected by Pneumonia.
- Among females, 58.3% of them were affected by Bronchitis 25%% of them were affected by Bronchiolitis and 16.6% were affected by Pneumonia.

- Among the prescriptions of paediatric patents, the
 most commonly prescribed antibiotics were
 Cephalosporin antibiotics (62.1%) (Cefuroxime,
 Cefoperazone Sulbactam and Ceftriaxone) followed
 by Macrolide antibiotics (21.6%) (Clarithromycin
 and Azithromycin) and Penicillin antibiotics
 (16.2%) (Amoxicillin Clavulanic acid and
 Piperacillin Tazobactam).
- Among the prescriptions of adult patents, the most commonly prescribed antibiotics were Cephalosporin antibiotics (58.6%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide antibiotics (24.1%) (Clarithromycin and Azithromycin) and Penicillin antibiotics (17.2%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam).
- Among the prescriptions of geriatric patents, the most commonly prescribed antibiotics were Cephalosporin antibiotic (57.6%) (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide antibiotics (19.2%) (Clarithromycin and Azithromycin), Penicillin antibiotics (11.5%) (Amoxicillin Clavulanic acid and Piperacillin Tazobactam) and Carbapenem antibiotics (11.5%) (Meropenem).
- Health related quality of life was assessed using SF-questionnaire.
- When comparing the physical functioning, percentage score before counselling was 24% and after counselling was 78%.
- When comparing the role limitation due to physical health, percentage score before counselling was 23% and after counselling was 77%.
- When comparing the role limitation due to emotional problem, percentage score before counselling was 22.21% and after counselling was 82%.
- When comparing the energy/fatigue, percentage score before counselling was 15% and after counselling was 84%.
- When comparing the emotional well-being, percentage score before counseling was 24% and after counselling was 84%.
- When comparing the social functioning, percentage score before counselling was 23% and after counselling was 89%. When comparing the pain score, percentage score before counselling was 27% and after counselling was 83.7%.
- When comparing the general health, percentage score before counselling was 25% and after counselling was 85%.
- When comparing the health change, percentage score before counselling was 20% and after counselling was 77%.
- When comparing the overall quality of life, percentage score before counselling was 22.57% and after counselling was 82.18%. The result was significant and concluded that the overall quality of life percentage score after therapy and counselling was significantly increased than the before therapy

and counselling.

6.2. CONCLUSION

Lower respiratory tract infection (LRTI) occurs when there is an infection in the lungs, specifically in the lower airways, typically caused by viruses, bacteria, or other less common organisms. LRTIs encompass Bronchitis, Bronchiolitis and Pneumonia.

In this study, LRTIs were identified as the most prevalent respiratory diseases. Among LRTIs, Bronchitis was the most common, followed by Bronchiolitis and Pneumonia. The pediatric population was the most affected, followed by adults and geriatric population. Males were more commonly affected by LRTIs than females. The most commonly prescribed antibiotics were Cephalosporin antibiotics (Cefuroxime, Cefoperazone Sulbactam and Ceftriaxone) followed by Macrolide antibiotics (Clarithromycin and Azithromycin), Penicillin antibiotics (Amoxicillin Clavulanic acid and Piperacillin Tazobactam) and Carbapenem antibiotics (Meropenem). Improvements in quality of life were assessed using the SF-36 questionnaire. A paired t-test was used to compare the overall quality of life before and after treatment, revealing a significant increase in quality of life following treatment and patient counselling.

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