

“STUDY ON ANTIBIOTIC PRESCRIPTION PATTERN IN LOWER RESPIRATORY TRACT INFECTIONS IN PAEDIATRICS IN TERTIARY CARE TEACHING HOSPITAL”**Tupakula Karthik Babu*¹, Dr. B. Sai Vikas¹, Vishwas A.T.L², Dr. Joga Sasidhar³, Vinnakota Saikrishna⁴, Dr. R. Sainath Gupta⁵**^{1,3,5}Department of Pharmacy Practice, Bharathi College of Pharmacy, Bharathinagara, K.M. Doddi, Mandya, Karnataka, India-571422.^{*1,2,4}Pharm.D Intern, Department of Pharmacy Practice, Bharathi College of Pharmacy, Bharathinagara, K.M. Doddi, Mandya, Karnataka, India-571422.***Corresponding Author: Tupakula Karthik Babu**

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ABSTRACT

Background: Antibiotics are strong and effective medicines, used to treat various bacterial infections. Respiratory infections are the most common infections among paediatrics. Antibiotics are among the most commonly prescribed drugs in paediatrics. Overuse and inappropriate use of antibiotics has led to antibiotic resistance and treatment failure. **Objectives:** To assess the prescription pattern of antibiotics in lower respiratory infections in paediatrics of a Tertiary Care Teaching Hospital. **Study Design:** A retrospective study was done in a paediatric department in Mandya district hospital. Ethical clearance was obtained. The patient data was collected by using well designed patient data collection form and their prescription were recorded and analysed. **Result:** A total of 100 cases of various infections are examined among that 55% male and 45% female. Respiratory tract infection is the most common infectious disease in paediatrics is 67% and among them pneumonia is comparatively more than the wheezing associated LRTI, bronchitis and asthma i.e. 52%, 11%, 2%, 2% respectively. Out of 67 patients, suffering from respiratory tract infections 33 patients received two antibiotics in prescription followed 28 patients received single antibiotic, 4 patients received three antibiotics and 2 patients received four antibiotics. **Conclusion:** Respiratory tract infection is the most common infectious diseases, which includes pneumonia, wheezing associated LRTI, bronchitis, and asthma. Among them pneumonia comprises the greater portion in the paediatrics.

KEYWORDS: Antibiotic, Paediatrics, Prescription pattern, Resistance, rational.**INTRODUCTION**

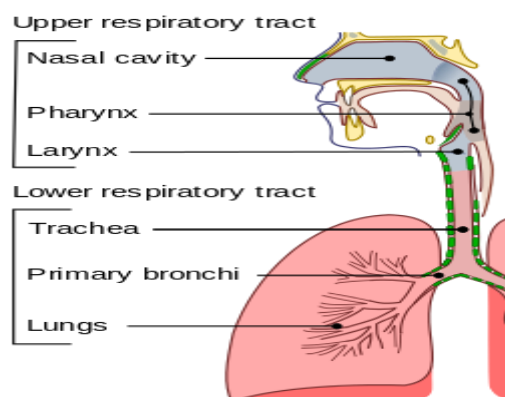
Respiratory infections remain the major cause of morbidity from acute illness in worldwide and likely represent the most common reasons why patients seek medical attention. RTI are categorized into two types: Upper respiratory tract infections (URI or URTI) and Lower respiratory tract infection (LRTI).

Upper respiratory tract infections (URI or URTI) are illnesses caused by an acute infection which involves the upper respiratory tract including the nose, sinuses, pharynx or larynx.

URTI includes

- Pharyngitis
- Laryngitis
- Sinusitis
- Otitis media
- Common cold.

Symptoms of URTIs commonly include cough, sore throat, runny nose, nasal congestion, headache, low grade fever, facial pressure and sneezing. Onset of symptoms usually begins 1–3 days after exposure. The illness usually lasts 7–10 days.^[1]



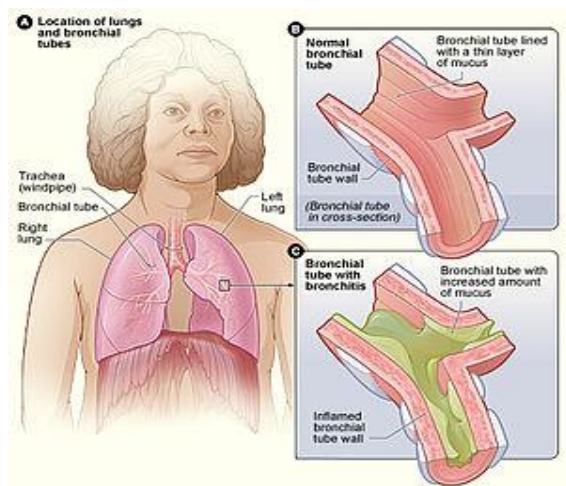
Lower respiratory tract infection (LRTI), while often used as a synonym for pneumonia, can also be applied to other types of infection including lung abscess and acute bronchitis.

Symptoms include shortness of breath, weakness, fever, coughing and fatigue. There are a number of symptoms that are characteristic of lower respiratory tract infections. The two most common are bronchitis and pneumonia. Influenza affects both the upper and lower respiratory tracts.^[2]

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 extra pulmonary 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 gain access to the normally sterile lower airways and alveoli. When pulmonary defence mechanisms are functioning optimally, aspirated microorganisms are cleared from the region before infection can become established; however, aspiration of potential pathogens from the oropharynx can result in pneumonia if lung defences are impaired.^[3]

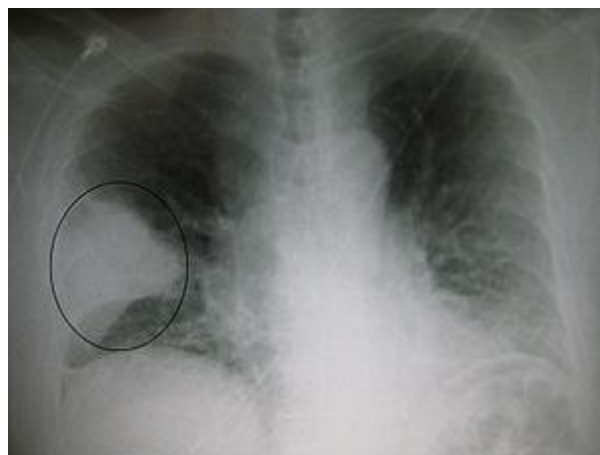
Bronchitis and bronchiolitis are inflammatory conditions of the large and small elements, respectively, of the tracheobronchial tree. The inflammatory process does not extend to the alveoli. Bronchitis frequently is classified as acute or chronic. Acute bronchitis occurs in individuals of all ages, whereas chronic bronchitis primarily affects adults. Bronchiolitis is a disease of infancy.^[3]

Acute bronchitis occurs most commonly during the winter months, following a pattern similar to those of other acute respiratory tract infections. Cold, damp climates and the presence of high concentrations of irritating substances (e.g., air pollution, cigarette smoke).^[3]



Pneumonia is an inflammatory condition of the lung affecting primarily the microscopic air sacs known as alveoli. Typical signs and symptoms include a varying severity and combination of productive or dry cough, chest pain, fever and trouble breathing, depending on the underlying cause.^[3]

Pneumonia in infants and children is caused by a wider range of microorganisms, and, unlike the situation in adults, nonbacterial pathogens predominate. Viruses, especially RSV, para influenza, cause most pneumonias occurring in the paediatric age group and adenovirus. *M. pneumoniae* is an important pathogen in older children. Beyond the neonatal period, pneumococcus is the major bacterial pathogen in childhood pneumonia, followed by group A *Streptococcus* and *S. aureus*. *H. influenzae* type b, once a major childhood pathogen, has become an infrequent cause of pneumonia since the introduction of active vaccination against this organism in the late 1980s.^[3]



Respiratory syncytial virus (RSV) is the leading cause of lower respiratory tract infections (LRTI) among infants. Wheezing following RSV LRTI is a well-documented phenomenon. The Tucson study found that obstructive respiratory symptoms following RSV in early childhood tend to diminish gradually with age until, by the age of 13 years, they no longer show any significant increase in prevalence.^[4,5]

Wheezing episodes are a common reason for the hospitalization of infants and young children and can cause significant clinical and socio-economic problems. Respiratory syncytial virus (RSV) has long been considered to be the main pathogen associated with wheezing, and it has been demonstrated that a lower airway illness caused by RSV in early childhood is an independent risk-factor for the development of subsequent wheezing episodes up to adolescence.^[4,5]

Asthma is characterized by chronic inflammation with the involvement of several cell types, associated with airway hyper responsiveness, with episodes of reversible airflow limitation. Bronchial asthma is a common chronic disease that affects people of all ages. All

patients with asthma are at risk of having exacerbations characterized by a progressive increase in shortness of breath, cough, wheezing or chest tightness.^[6]

Asthma is the most prevalent chronic disease in children, resulting in high demand for care in emergency departments as well as hospitalizations, with a negative impact on quality of life of children and adults.^[6]

The incidence of asthma has continuously risen during the last decades. Since about 10 years the prevalence seems to have reached a steady state. Still, bronchial asthma represents the most common chronic disease in childhood and is a major challenge for health care.^[7]

The loss of clinical and functional asthma control usually occurs gradually, but it can occur abruptly in a subgroup of patients. It is one of the main causes of emergency consultations, having been responsible, in 2007, for 195 deaths in children younger than 19 years in Brazil.^[8]

Various studies report that asthma control can be achieved for a majority of patients receiving appropriate asthma therapy, yet poor asthma control remains a large problem in the developed world.^[7]

Several other factors have been associated with lower asthma control in children; e.g. older age and the female sex, medication adherence, tobacco smoke exposure and increased body mass in boys. Furthermore, allergic comorbidity have been described as a determinant of poor asthma control, with eczema being associated with uncontrolled asthma during autumn and winter and allergic rhinitis during spring and summer. In general, asthma control is best during summer and lowest during autumn and spring.^[3]

Prescribing pattern helps in evaluating local consumption/resistance pattern for optimized therapeutic effect of medications. It also helps in planning various steps to be taken to minimize adverse drug reactions as children are more vulnerable to them and to provide cost effective medical care.^[38] Thus, the aim of our study was to assess the prescribing pattern of antibiotics in paediatrics in LRTI in MIMS TEACHING hospital.

OBJECTIVES

- To assess prescription pattern of antibiotics in LRTI in paediatrics.
- To analyse the various common respiratory infections in paediatrics.

MATERIALS AND METHODOLOGY

Study site

The present study was conducted in paediatric department of MIMS teaching hospital, Mandya it is a 650-bedded Tertiary Care teaching Hospital, providing specialized health care services to all strata of people in and around Mandya.

Study design

A hospital based Retrospective study was conducted in paediatric department unit.

Source of data

Patient data related to study was obtained from patient case records.

Study approval

Ethical clearance was obtained from the Institutional Ethics Committee of MIMS (Mandya).

Study criteria

• Inclusion Criteria

- All the paediatrics of age 1 month to 14 years.
- All prescriptions containing antibiotics in in-patients with LRTI.

• Exclusion Criteria

- Paediatrics from neonatal intensive care unit.
- Antibiotics used for infections other than RTI.

Study procedure

A suitably designed data collection form was used to record all the necessary data including patient's gender, age, patient Medication history, reason for admission, lab investigations, drugs and diagnosis.

Statistical method

A simple percentage calculation was conducted to arrive conclusion of our study. Microsoft word and Excel have been used to generate graphs, tables etc.

RESULTS

We had done analysis on 100 cases in paediatric department among that 55% male and 45% female (Table.1).

Table 1: DISTRUBUTION OF PATIENTS BASED ON GENDER WISE.

GENDER	NO. OF PATIENTS	IN PERCENTAGE
MALE	55	55%
FEMALE	45	45%

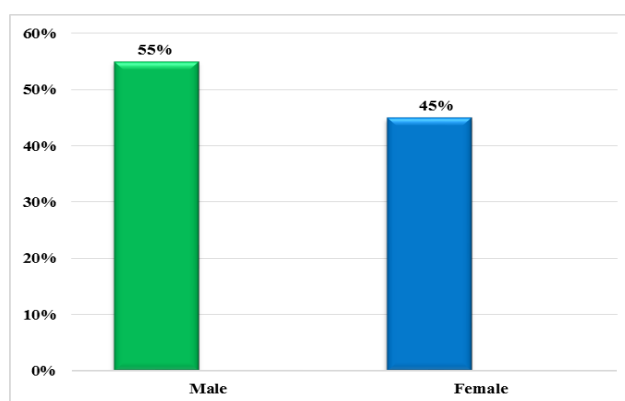


Fig 1: DISTRUBUTION OF PATIENTS BASED ON GENDER WISE.

Table.1 and Figure 1 showed that gender wise distribution of patients which shows male patients (55%) is more than female patients (45%).

Out of 100 cases included in study, 67 patients are admitted with lower respiratory infectious diseases and among them 34 are male patients and 33 are female patients. (Table.2 and fig.2).

Table 2: PATIENT DISTRIBUTION BASED LRTI

GENDER	NO. OF PATIENTS	IN PERCENTAGE
MALE	34	34%
FEMALE	33	33%

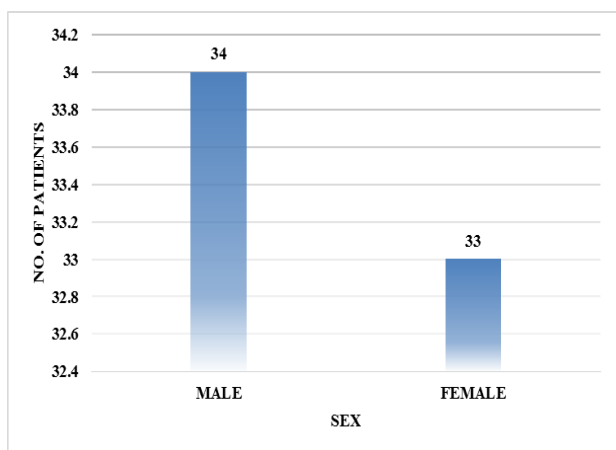


Fig 2: PATIENT DISTRIBUTION BASED LRTI

Respiratory tract infection is the most common infectious disease in paediatrics i.e.67 out of 100 patient analysed within study.

On analysis of 67 LRTI patients, it represents patients admitted with pneumonia is comparatively more than the wheezing associated LRTI, bronchitis and asthma i.e. 52%, 11%, 2%, 2% respectively.

Table 4: PRESCRIPTION PATTERN IN PNEUMONIA

DRUG THERAPY	ANTIBIOTICS	NO. Of PATIENTS	PERCENTAGE
ONE-DRUG	AMOXI+CLAV	15	28%
	CEFTRIAXONE	3	6%
	AMPICILLIN	1	2%
TWO-DRUG	CEFOTAXIME+AMIKACIN	13	25%
	AMOXICLAV+AMIKACIN	9	17%
	CEFTRIAXONE+AMIKACIN	5	10%
	CEFTRIAXONE+ AMOXICLAV	4	8%
THREE-DRUG	CEFTRIAXONE+AMIKACIN+ AMOXICLAV	1	2%
FOUR-DRUG	CEFTRIAXONE+AMIKACIN+ AMOXICLAV+ AZITHROMYCIN	1	2%

Table 3: VARIOUS DIAGNOSIS OF LOWER RESPIRATORY INFECTIOUS

TYPES OF LRTI	NO. OF PATIENTS	PERCENTAGE
PNEUMONIA	52	52%
WHEEZING ASSOCIATED LRTI	11	11%
BRONCHITIS	2	2%
ASTHMA	2	2%

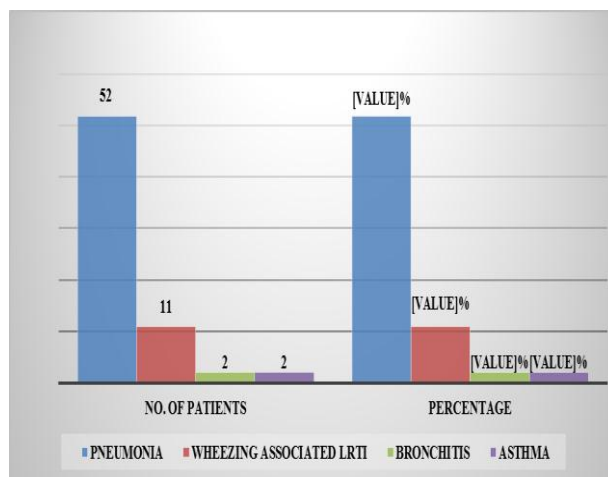


Fig 3: VARIOUS DIAGNOSIS OF LOWER RESPIRATORY INFECTIOUS

Out of 67 patients suffering from respiratory tract infections 33 patients received two drugs in prescription followed by 28 patients received single drug, 4 patients received three drug and 2 patients received 4 drug.

Out of 52 patients with pneumonia, 19 patients were prescribed with single antibiotic, followed by 31 patients prescribed with two antibiotics, one patients with three antibiotics and one patient with four antibiotics.

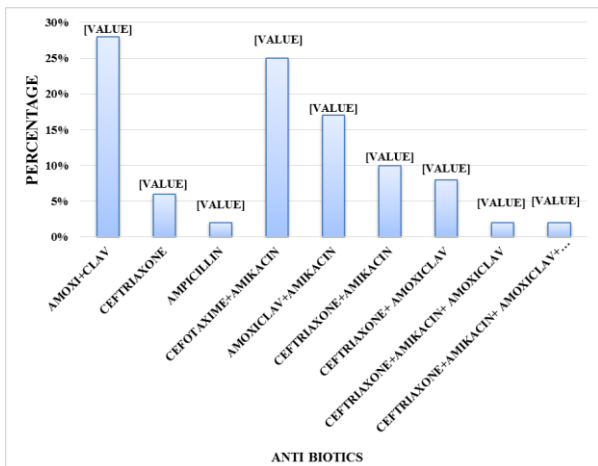


Fig 4: PERCENTAGE OF INDIVIDUAL ANTIBIOTICS PRESCRIPTION IN PNEUMONIA

Out of 11 patients with wheeze associated LRTI, 7 patients were prescribed with single antibiotic, followed by one patient prescribed with two antibiotics, two patients with three antibiotics and one patient with four antibiotics.

Table 5: PRESCRIPTION PATTERN IN WHEEZE ASSOCIATED LRTI

DRUG THERAPY	ANTIBIOTICS	NO. Of PATIENTS	PERCENTAGE
ONE-DRUG	AMOXI+CLAV	5	46%
	CEFOTAXIME	2	18%
TWO-DRUG	CEFTRIAXONE+AMIKACIN	1	9%
THREE-DRUG	CEFOTAXIME+AMIKACIN+ AMOXICLAV	2	18%
FOUR-DRUG	CEFOTAXIME+AMIKACIN+ AMOXICLAV+AZITHROMYCIN	1	9%

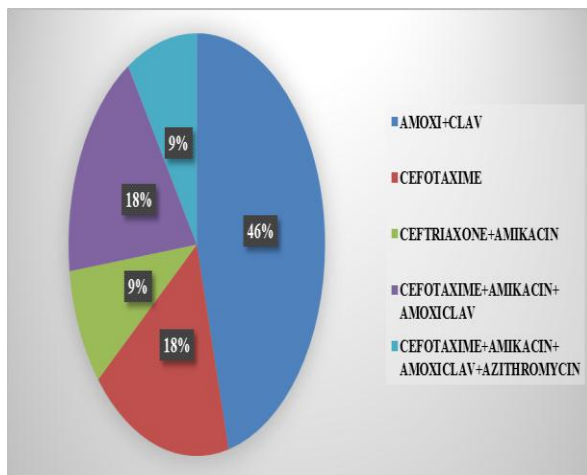


Fig 5: PRESCRIPTION PATTERN IN WHEEZE ASSOCIATED LRTI

Out of 2 patients with bronchitis, 1 patient was prescribed with single antibiotic, followed by one patient prescribed with two antibiotics.

Table 6: PRESCRIPTION PATTERN IN BRONCHITIS

DRUG THERAPY	ANTIBIOTICS	NO. Of PATIENTS	PERCENTAGE
ONE-DRUG	AMOXI+CLAV	1	50%
TWO-DRUG	AMOXICLAV+AMIKACIN	1	50%

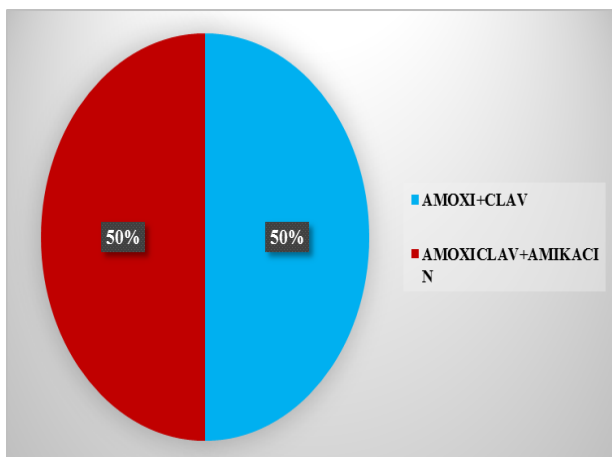


Fig 6: PRESCRIPTION PATTERN IN BRONCHITIS

Out of 2 patients with asthma, 1 patient was prescribed with two antibiotics, followed by one patient prescribed with three antibiotics.

Table 7: PRESCRIPTION PATTERN IN ASTHMA

DRUG THERAPY	ANTIBIOTICS	NO. Of PATIENTS	PERCENTAGE
TWO-DRUG	AMPICILLIN+ AZITHROMYCIN	1	50%
THREE-DRUG	AMOXICLAV+AMIKACIN+ AZITHROMYCIN	1	50%

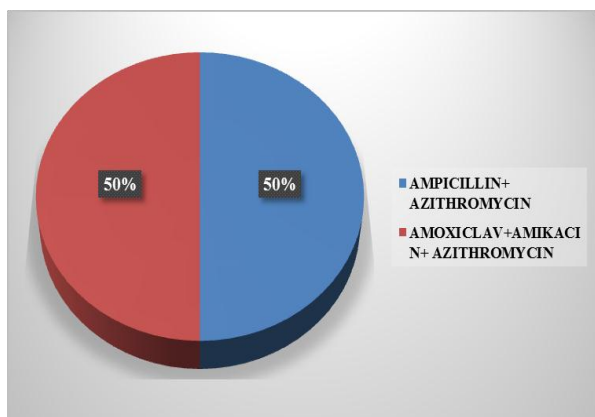


Fig 7: PRESCRIPTION PATTERN IN ASTHMA

Among 67 lower respiratory tract infectious patients most common infectious diagnosis was pneumonia followed by wheezing associated LRTI, bronchitis and asthma with 52%, 11%, 2%, 2% respectively.

Out of 67 patients, suffering from respiratory tract infections 33 patients received two antibiotics in prescription followed 28 patients received single antibiotic, 4 patients received three antibiotics and 2 patients received four antibiotics.

Out of 52 patients with pneumonia, 19 patients were prescribed with single antibiotic, followed by 31 patients prescribed with two antibiotics, one patients with three antibiotics and one patient with four antibiotics.

Out of 11 patients with wheeze associated LRTI, 7 patients were prescribed with single antibiotic, followed by one patient prescribed with two antibiotics, two patients with three antibiotics and one patient with four antibiotics.

Out of 2 patients with bronchitis, 1 patient was prescribed with single antibiotic, followed by one patient prescribed with two antibiotics.

Out of 2 patients with asthma, 1 patient was prescribed with two antibiotics, followed by one patient prescribed with three antibiotics.

DISCUSSION

Worldwide population constitute of about 28% of children and infants who are most susceptible to diseases due to under development of immune system. The use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of paediatric illnesses. Antibiotics represent one of the most commonly used drugs in paediatrics ward. Their irrational use leads to a number of consequences in terms of cost, drug interactions, hospital stay, bacterial resistance and increased medication error.

The present study was carried out in paediatrics department and cases collected from in-patients case sheets from wards in MIMS Mandya. In our study, out of 100 patients 67 are infected with lower respiratory infection among them 34 were male and 33 were female paediatric patients.

CONCLUSION

This study gives an overview of the pattern of antibiotic use for lower respiratory tract infections in paediatric department in MIMS, Mandya.

We can conclude that:

- The most common illness for which children were hospitalized involves respiratory tract infection.
- Lower respiratory tract infections are common infections in paediatrics.
- Among 67 lower respiratory tract infectious patients most common infectious diagnosis was pneumonia followed by wheezing associated LRTI, bronchitis and asthma with 52%, 11%, 2%, 2% respectively.
- Out of 67 patients suffering from respiratory tract infections 33 patients received two drugs in prescription followed by 28 patients received single drug, 4 patients received three drug, and 2 patients received 4 drug.

CONFLICT OF INTEREST

All the authors declare that there is no potential conflict of interest in the study.

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