

**Prescription Pattern of Antibiotic Use in Respiratory Tract Infections in a Tertiary Care Teaching Hospital**Syed Wasif<sup>1</sup>, Sagar H<sup>2</sup>, Harish. G. Bagewadi<sup>3</sup>, S N Mani Devi Karampudi<sup>4</sup><sup>1</sup>Assistant Professor, Department of Pharmacology, GIMS, Kalaburagi<sup>2</sup>Assistant Professor, Department of General Medicine, GIMS, Kalaburagi<sup>3</sup>Associate Professor, Department of Pharmacology, GIMS, Kalaburagi<sup>4\*</sup>Assistant Professor, Department of Pulmonary Medicine, GIMS, Kalaburagi

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**Abstract:****Background:** Respiratory tract infections were one of the most common infectious diseases among human beings all over the world.**Objective of the study:** To assess the prescription pattern of antibiotic use in Respiratory Tract Infections in a tertiary care teaching hospital.**Materials and Methods:** It is a prospective, observational study in which 150 random patients attending Medicine OPD at GIMS, Kalaburagi with Respiratory Tract Infections were taken. Prescription, demographic and clinical assessment details were recorded in the Case Record Form (CRF).**Results:** In total of 150 patients taken in this study, Azithromycin (n=50), Levofloxacin (n=50), Amoxicillin (n=28) and Cefixime (n=22) drugs were prescribed for URTI. On day 3, Azithromycin group (n=18,36%), Levofloxacin group (n=29,58%), Amoxicillin group (n=17,60%) and Cefixime group (n=14,64%) subjects still had one or more symptoms (cough, fever, sore throat, running nose or breathlessness). On day 5, Cefixime group (n=7,32%) had more than one symptoms, other groups had only few subjects with symptoms.**Conclusion:** In this study, Azithromycin and Levofloxacin were the common drugs prescribed for respiratory tract infections followed by Amoxicillin and Cefixime. Azithromycin was more efficacious compared to other drugs.**Keywords:** Respiratory tract infections, Azithromycin, Levofloxacin, Amoxicillin, Cefixime.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Respiratory tract infections were one of the most common infectious diseases among human beings all over the world, they remain a significant threat to public health causing mortality and morbidity in individuals irrespective of age, sex, socioeconomic or lifestyle.

Respiratory tract infections were responsible for around more than 1.2 million deaths in India respiratory tract infections were divided into upper respiratory tract infections (URTI) and lower respiratory tract infections (LRTI). URTI include common cold pharyngitis, sinusitis, and tracheobronchitis. LRTI include bronchitis, pneumonia, and various viral lower respiratory tract infections. Different antibiotics from various groups of drugs were used for Respiratory tract infections in different clinical health setups; even different health professionals use different antibiotics for same Respiratory tract infections.

They were used for prophylactic or therapeutics purposes. Inappropriate or improper use of antibiotics in respiratory tract infections leads to various health and economic issues like increase mortality and morbidity, antibiotic resistance, increase cost of treatment, non-compliance of patients, increase in incidence and severity of adverse effects etc. Respiratory Tract Infections were one of the commonest infectious diseases of humankind.

Their incidents were more common in some particular seasons. Respiratory Tract Infections include Upper Respiratory Tract Infections &amp; Lower Respiratory Tract Infections. [1] Various groups of antibiotics were used for these kinds of infection like Macrolides, Fluoroquinolones, Penicillins, Cephalosporins, Glycopeptide Antibiotics, Tetracyclines, Monobactams, and Carbapenems etc. These antibiotics act by different

mechanisms and were effective against various groups of pathogens that were involved in various Respiratory Tract Infections [2,3,4]

There are very few studies in the literature showing the prescription pattern of antibiotic usage in respiratory tract infections in a tertiary care teaching hospital especially in north Karnataka region. A particular antibiotic is preferred by various healthcare professionals for the same Respiratory Tract Infections. Prescribers were not having any standard antibiotic prescribing guidelines for Respiratory Tract Infections. [5] Some studies show over prescription for Upper Respiratory Tract Infections as well as Lower Respiratory Tract Infections. [6] Most of the times, the drug used were as Monotherapy.[7]

Improper, inappropriate and irrational use of antibiotics in Respiratory Tract Infections is rampant leading to dangerous health complications like antibiotic resistance, therapeutic failure and increased adverse effects. So prescribing guidelines for Respiratory Tract Infections becomes necessary. [8] High rate of antibiotic use for different types of Respiratory Tract Infections is also inappropriate. [9] Rational and appropriate use of antibiotics in Upper Respiratory Tract Infections will also lead to shorter visit duration of patients to hospital. That benefits them by decreasing exposure to nosocomial infections and decreases their health expenses and also doctors' burden. [10] Some interventions directed towards guardians of the patients and/or clinicians can also reduce the rate of antibiotic use. [11] Inappropriate prescribing of antibiotics in some self-limiting Respiratory Tract Infections is also very common. [12-14]

Hence periodic revisions on guidelines and recommendations for antibiotic use in Respiratory tract infections are necessary for rational and appropriate use of antibiotics. [15] A study to see the prescription pattern of antibiotic use is thus necessary to briefly assess the pattern of use of antibiotic in respiratory tract infections to monitor evaluate and if necessary, suggests any modifications to make the prescriptions more rational for the betterment of patient and society. Hence the above study is undertaken.

**Aims & Objectives:** To assess the prescription pattern of antibiotic use in Respiratory Tract Infections in a tertiary care teaching hospital.

#### **Materials and Methods**

**Source of Data:** OPD Patients attending Medicine Department, GIMS, Kalaburagi

**Study Design:** Prospective observational based study.

**Study Period:** Study will be conducted over a period of One Month.

#### **Inclusion Criteria:**

1. Patients with respiratory tract infections diagnosed by physicians.
1. Out-Patients willing to participate in study and giving informed consent.
2. Patients above 18 years of age.

#### **Exclusion Criteria:**

1. Patients admitted in the Hospital (In-Patients)
2. Patients on Anti Tubercular Drugs and Anti-Retroviral Drugs
3. Patients with other systemic infections
4. Patients receiving any parenteral medications.

#### **Methods of collection of Data**

After taking institutional ethical committee permission, a total number of 100 patients attending Medicine OPD at GIMS, Kalaburagi with Respiratory Tract Infections and giving informed consent were taken in the study.

Their demographic details, clinical assessment details, prescription details and any lab investigation details (optional) were recorded in the Case Record Form (CRF). Follow-up of the patients were done for evaluation according to the course of the treatment. Method of follow up of patients is done by asking patients to visit once a month or by calling the patients over phone and recording information. Medicines were provided in our college pharmacy, free of cost. If medicine not available, researcher will bear the cost of the treatment. Statistical Analysis: Descriptive statistics and other suitable statistical tests were used for analysis of data.

#### **Results**

A total of 150 patients with upper respiratory tract infections were taken in this study. Table 1 shows age and gender distribution of the study subjects. Females (n=81,54%) and males (n=69,46%) participated in the study. 35% (n=53) in age group 18-49 years, 32% (n=48) in age group 50-64 years and 30% (n=45) in age group 65-79 years were involved in this study.

In this study, patients in Azithromycin group (n=50,33%), Levofloxacin group (n=50,33%), Amoxycillin group (n=28,19%) and Cefixime group (n=22,15%) participated. Male and female patients were distributed randomly in different antibiotics group according to the spontaneous prescription in the OPD.

**Figures 1-5** shows bar charts of effects of different drugs prescribed in OPD on various symptoms of URTI (cough, fever, sore throat, running nose, breathlessness) starting from day-1 to the end of treatment (day-7).

All the study subjects had all symptoms on day 1. Figure 1 shows effects of drugs on cough. On day 3, subjects in Azithromycin group (n=14,28%), Levofloxacin group (n=19,38%), Amoxicillin group (n=12,42%) and Cefixime group (n=15,68%) had cough and till day 5, Levofloxacin group (n=7,28%), and Cefixime group (n=5,22%) with very few in other groups left with cough.

**Figure 2 shows effects of drugs on fever.** At day 3, study subjects in Azithromycin group (n=22,44%), Levofloxacin group (n=27,54%), Amoxicillin group (n=12,43%) and Cefixime group (n=15,68%) continued fever which on day 5 was present significantly only in Cefixime group (n=,31%), negligible in rest other groups.

**Figure 3 shows effects of drugs on sore throat.** Sore throat was one symptom which was present in maximum patients in day 3 (Azithromycin group (n=32,64%), Levofloxacin group (n=42,84%), Amoxicillin group (n=12,42%), Cefixime group (n=14,63%)).

On day 5, Azithromycin group (n=24,48%) and Levofloxacin group (n=29,58%) had sore throat. Sore throat was the only symptom which was still present till day 7 of different drugs treatment though in very few subjects except Levofloxacin group (n=9,18%).

**Figure 4 shows effects of drugs on running nose.** On day 3, patients in Azithromycin group

(n=28,56%), Levofloxacin group (n=31,62%), Amoxicillin group (n=12,43%) and Cefixime group (n=14,64%) had running nose and only significantly in Levofloxacin group (n=19,38%) on day 5.

**Figure 5 shows effects of drugs on breathlessness.** Breathlessness resolved fast compared to other symptoms, Azithromycin group (n=12,24%), Levofloxacin group (n=14,28%), Amoxicillin group (n=11,39%) and Cefixime group (n=13,59%) on day 3 and only few patients had breathlessness at day 5 in all drug groups.

**Figure 6 shows usage of antibiotics in URTI and number of patients with symptoms on respective days.** In total of 150 patients taken in this study, Azithromycin (n=50), Levofloxacin (n=50), Amoxicillin (n=28) and Cefixime (n=22) drugs were prescribed for URTI. On day 3, Azithromycin group (n=18,36%), Levofloxacin group (n=29,58%), Amoxicillin group (n=17,60%) and Cefixime group (n=14,64%) subjects still had one or more symptoms (cough, fever, sore throat, running nose or breathlessness). On day 5, Cefixime group (n=7,32%) had more than one symptoms, other groups had only few subjects with symptoms. All symptoms in all the drug groups subsides till 7<sup>th</sup> day except sore throat, which was particularly more in Levofloxacin group (n=9,18%).

**Table 1: Age and gender distribution**

Age Group	no. of Patients	Gender (M- 69,F-81)	Azithromycin	Levofloxacin	Amoxicillin	Cefixime
Age 18-49	53	M-27 F-26	M-13 F-6	M-7 F-12	M-3 F-5	M-4 F-3
Age 50-64	48	M-20 F-28	M-8 F-4	M-4 F-13	M-5 F-6	M-3 F-5
Age 65-79	45	M-19 F-26	M-6 F-12	M-8 F-4	M-2 F-7	M-3 F-3
Age > 80	4	M-3 F-1	M-1 F-0	M-1 F-1	M-0 F-0	M-1 F-0
Total	150	150	50	50	28	22

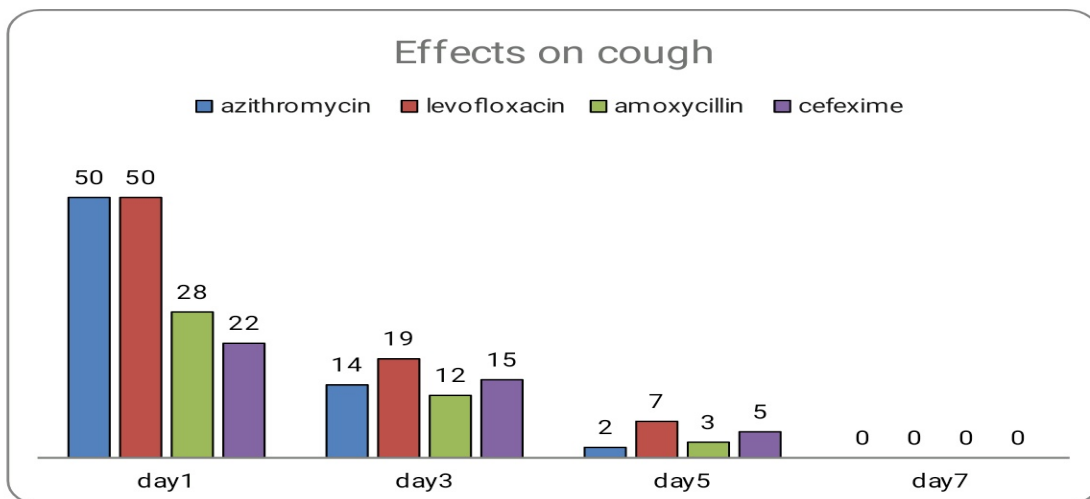


Figure 1: Effects of drugs on cough

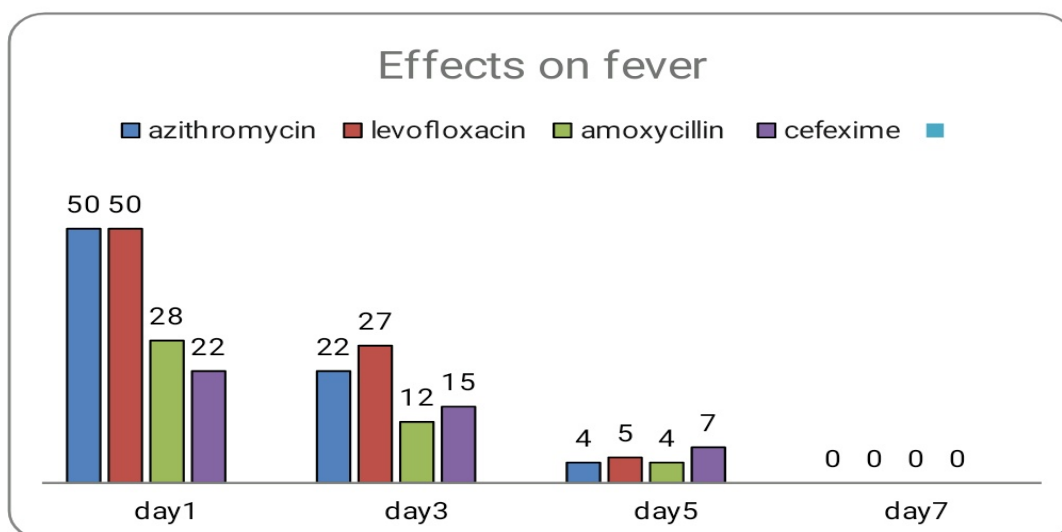


Figure 2: Effects of drugs on fever

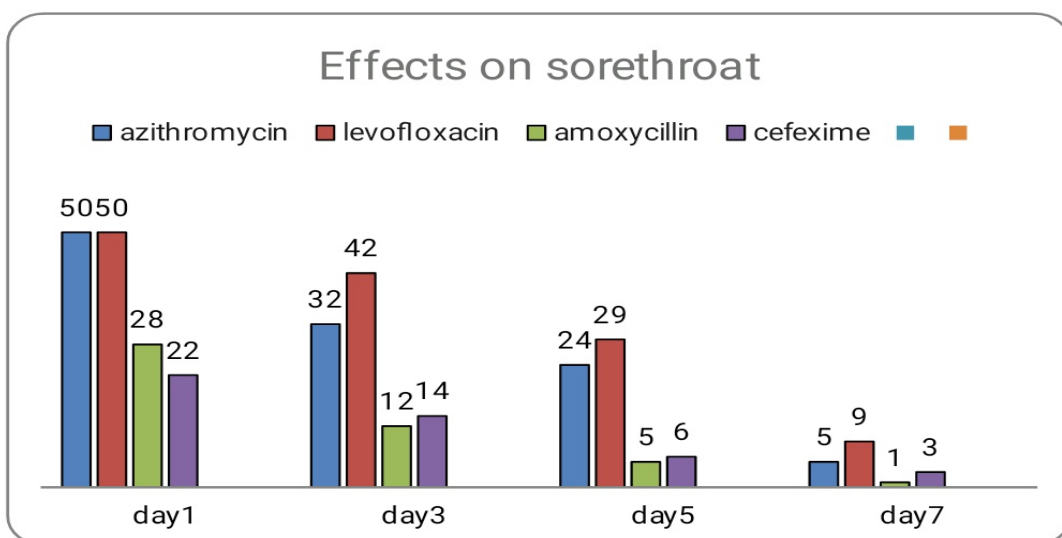


Figure 3: Effects of drugs on sore throat

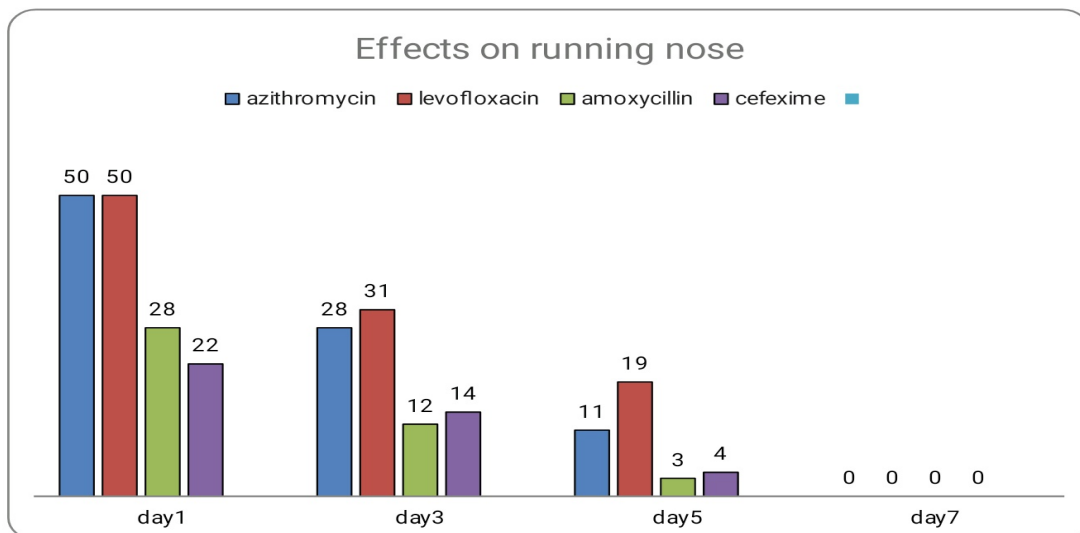


Figure 4: Effects of drugs on running nose

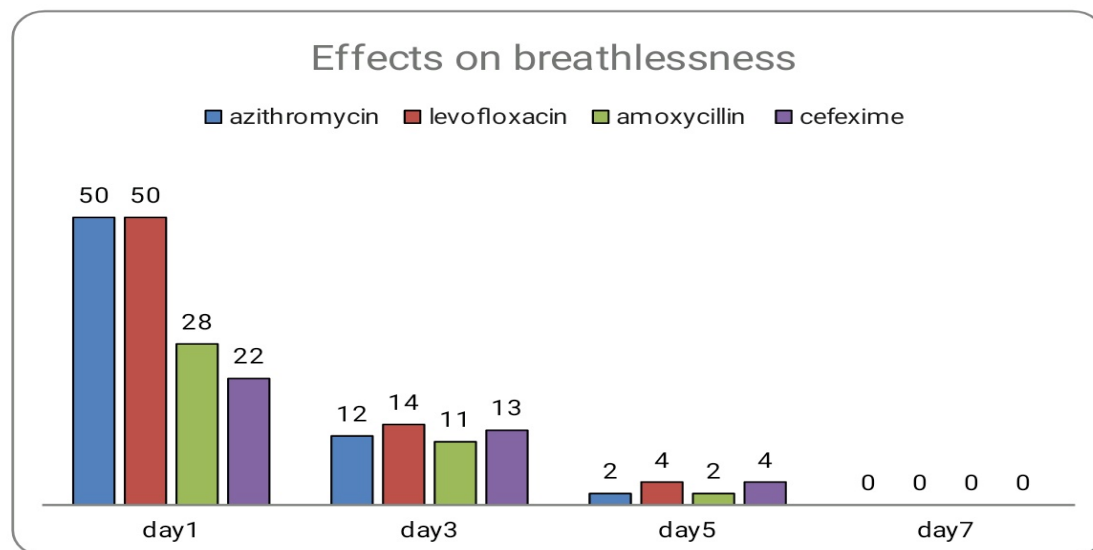


Figure 5: Effects of drugs on breathlessness

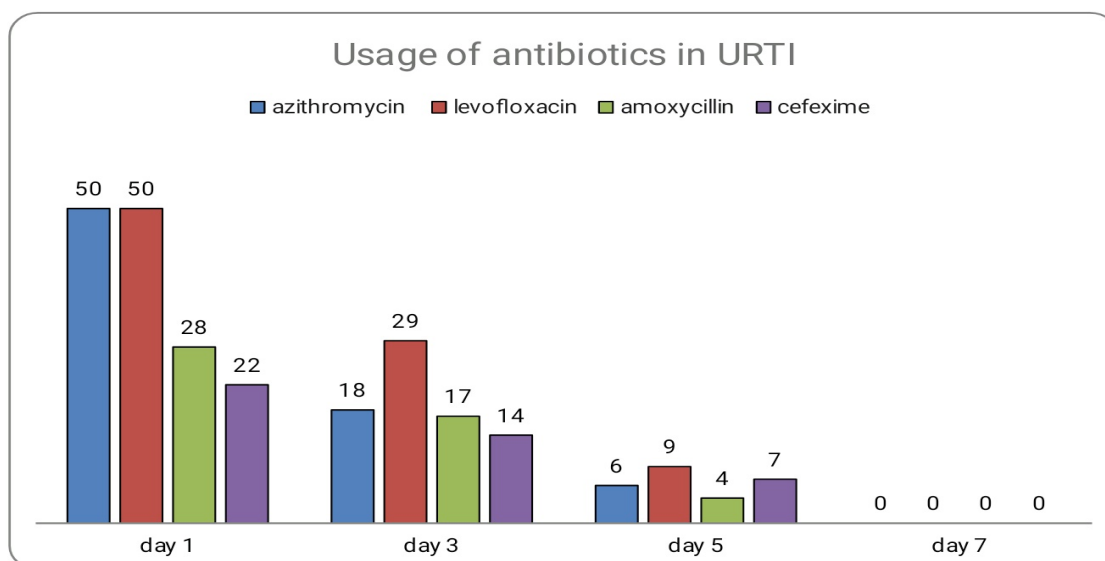


Figure 6: usage of antibiotics in URTI and number of patients with symptoms on respective days

## Discussion

Respiratory tract infections were common medical conditions encountered by health professionals in day-to-day practice, particularly with change in temperatures in different seasons. Most of the time, antibiotics were not necessary and can be treated just for the symptoms with anti-allergy, anti-pyretic, anti-tussive drugs etc. Antibiotics should be prescribed in evidence of infection in URTI [13,15]. In this study, antibiotics (Azithromycin, Levofloxacin, Amoxicillin and Cefixime) were used in respiratory tract infections based on clinical symptoms (cough, fever, sore throat, running nose or breathlessness) but no microorganisms testing is done.

In this study, Azithromycin and Levofloxacin were the most common drugs prescribed for respiratory tract infections in contrast to the studies of Kokani V. R. et al and Errabelly P. et al [7,8]. In this study, more number of female patients participated compared to males. More patients were seen in age group 18-49 years, but comparable with age groups 50-64 and 65-79 years. In this study, Azithromycin appears to be the most efficacious drug with decrease in various symptoms from 3rd day itself of treatment as in contrast to the study by Martinez FJ et al [19]. Levofloxacin and Amoxicillin were nearly equal in controlling the clinical features of URTI, least efficacy is seen with cefixime in our study. Only few patients reported adverse effects in all drug groups (among highest in levofloxacin group) in this study. Adverse effects like anoxeria and itching were seen in Azithromycin group, headache, nausea and vomiting were seen in Levofloxacin group, diarrhoea is seen in Amoxicillin group and nausea, vomiting is seen in Cefixime group.

**Limitations-** The limitations of our study were

1. Small sample size
2. Short data collection period (1 month)
3. Complete microorganisms testing by culture and antibiotic spectrum analysis is not done in all subjects.

## Conclusion

In this study, Azithromycin and Levofloxacin were the common drugs prescribed for respiratory tract infections followed by Amoxicillin and Cefixime. Azithromycin was more efficacious compared to other drugs.

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