International Journal of Community Medicine and Public Health
Gupta N et al. Int J Community Med Public Health. 2024 Apr;11(4):1608-1611
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20240898

Original Research Article

An ambispective observational study on antibiotics in pulmonology department in a tertiary care hospital

Nikita Gupta[1]*, Swetha Singarapu[2], M. Ilham Ahmed[2], Hema Pasupuleti[2], Sameera Fatima[2]

[1]Department of Pharmacy Practice, St. Pauls College of Pharmacy, Turkayamjal, Hyderabad, Telangana, India
[2]St. Pauls College of Pharmacy, Turkayamjal, Hyderabad, Telangana, India

Received: 07 February 2024
Revised: 10 March 2024
Accepted: 13 March 2024

***Correspondence:**
Dr. Nikita Gupta,
E-mail: Nikitagupta250@gmail.com

ABSTRACT

Background: Respiratory tract infections (RTIs) caused by various viruses and bacteria are a major cause of morbidity and mortality worldwide. Although they are usually more severe in children, the elderly and people with weakened immune systems, people of all ages and backgrounds are susceptible to these infections. Antibiotics are commonly prescribed for RTIs in primary care in adults and children. The main purpose of this study is to monitor the use of different antibiotics for respiratory infections.
Methods: It is an ambispective observational study, during which data are collected on specially designed data collection forms. The study lasted 6 months (from December 2022 to May 2023).
Results: The source of data is a total of 100 patients who were prescribed at least one dose of antibiotics. Out of 100 people, 53% were men and 47% were women. LRTI and URTI are the most common conditions for which antibiotics are prescribed, and we found that the most commonly prescribed antibiotics are a higher percentage of patients using cephalosporins. Of the various cephalosporins, the most commonly prescribed is ceftriaxone, a third-generation cephalosporin.
Conclusions: From this particular observational study, we concluded that the most frequently prescribed antibiotics for respiratory infections were cephalosporins, ceftriaxone, third-generation cephalosporins were most frequently prescribed, followed by macrolides, penicillin, tetracyclines, lincomycin, fluoroquinolones, oxazolidinones. The use of antibiotics helps to improve patient care by reducing side effects such as antibiotic resistance, hypersensitivity reactions, respiratory difficulties and risks associated with respiratory infections.

Keywords: Respiratory tract infections, LRTI, URTI

INTRODUCTION

Respiratory tract infection (RTI) is a prevalent issue in primary care and a significant public health concern. It is responsible for substantial number of illnesses and deaths in developing countries. RTI refers to any infectious disease that affects upper/lower respiratory tract.[1]

LRTI is a broad terminology which includes different diseases including acute bronchitis, pneumonia, and acute exacerbation of chronic lung diseases such as COPD or bronchiectasis. Annual incidence of pneumonia, one of the most important LRTIs, is reported to be 24.8 per 10,000 adults.[2]

Upper RTIs can be defined as self-limited irritation and swelling of the upper airways with associated cough and no signs of pneumonia.[3]

Pneumonia is an inflammatory condition of the lung primarily affecting the small air sacs known as alveoli. Symptoms typically include some combination of

productive or dry cough, chest pain, fever, and difficulty breathing.[4]

Chronic obstructive pulmonary disease (COPD) is a type of progressive lung disease characterized by long-term respiratory symptoms and airflow limitation. The main symptoms of COPD include shortness of breath and a cough, which may or may not produce mucus.[5]

Asthma is a long-term inflammatory disease of the airways of the lungs. It is characterized by variable and recurring symptoms, reversible airflow obstruction, and easily triggered bronchospasms symptoms include episodes of wheezing, coughing, chest tightness, and shortness of breath.[6]

Lung cancer, also known as lung carcinoma, is a malignant tumor that begins in the lung. Lung cancer is caused by genetic damage to the DNA of cells in the airways, often caused by cigarette smoking or inhaling damaging chemicals.[7]

According to the national health portal of India's 2019 report, there were a total of 41,996,260 cases and 3,740 fatalities resulting from respiratory infections in India during 2018. Acute respiratory infections (ARI) constituted 69% of all communicable disease cases, and this data predates the emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Since the onset of the coronavirus disease 2019 (COVID-19) pandemic, the number of infections has surged into the millions, with the new cases continuing to be reported.[8]

Antibiotics are essential in modern medicine and are crucial for preventing and treating infectious diseases. They are vital for the global community, and it is important to ensure their availability, appropriate selection, and proper use.[9]

The inappropriate prescribing of antibiotics has the potential to cause drug-related adverse events, escalate the prevalence of antibiotic-resistant organisms in the community and increase primary care consultation rates for minor illness.[10] Hence present study was conducted to evaluate the usage of various antibiotics in the RTIs.

Objectives

The main objectives of the study include to assess the usage trends of different antibiotics in RTIs, to analyze commonly prescribed antibiotics for infections and to access inappropriate prescribing habits.

METHODS

Study site and period

The study was conducted in a multispeciality hospital, Hyderabad for a period of 6 months i.e., from December 2022-May 2023.

Study design

It is an ambispective observational study.

Study instrument

Data is collected from patient's case report files in specially designed data collection form. Form includes patient demographic details, lab parameters like Hb, WBC count, CRP, procalcitonin, serum creatinine, radiology findings, dose, duration of drug administered.

Study was approved by institutional ethics committee of St. Pauls college of pharmacy, Osmania university, Hyderabad.

Inclusion criteria

Patients who are taking antibiotics in pulmonology department, patients of all age groups and both genders were included in study.

Exclusion criteria

Patients of LAMA (Leave against medical advice) discharge and pregnant and lactating women excluded.

Data analysis

The statistical program SPSS was used to collect and analyze data. Qualitative variables are given according to their frequency of distribution. Mean and standard deviation of quantitative data serve as a summary.

RESULTS

During a study period of 6 months i.e., from December 2022 to May 2023, a total of 100 sample were recorded. In our study the men are found to be 53 and women are 47 in number. LRTI and URTI are mostly diagnosed in pulmonology department. Antibiotics are mostly prescribed for the RTIs. In this study we found that the mostly prescribed antibiotics are cephalosporins followed by macrolides, penicillin.

Table 1: Demographics.

Characteristics	N (%)
Gender	
Male	53 (53)
Female	47 (47)

Continued.

Characteristics	N (%)
Age (in years)	
0-2	12 (12)
3-19	18 (18)
20-39	15 (15)
40-59	25 (25)
60-79	23 (23)
>100	7 (7)
Based on the condition	
LRTI/URTI	59 (59)
Pneumonia	20 (20)
Bronchial asthma/COPD/ bronchitis	13 (13)
Mesothelioma/ lung cancer	06 (6)
Pulmonary Koch's	02 (2)
Co-morbidities	
Yes	44 (44)
No	56 (56)
Antibiotics (%)	
Cephalosporins	53.9
Macrolides	26.3
Penicillin	6.1
Tetracyclines	4.2
Lincomycin	3
Fluoroquinolones	2.4
Oxazolidinone	2.4
Carbapenem	1.8
Glycopeptide	1.2
Type of therapy	
Mono therapy	47
Combination therapy	53

DISCUSSION

Antibiotics continue to be widely prescribed for patients presenting with RTIs.[11] Recommendations have been published advising against their use on the basis of increasing antimicrobial resistance in respiratory pathogens and lack of proven efficacy.

This study is conducted to evaluate the usage of different antibiotics in pulmonology department in a tertiary care hospital.

Numerous studies are carried out in various nations in order to observe the antibiotics utilization for RTIs. A retrospective study on antibiotic usage in a tertiary care hospital in Kerala from 2017-2018 conducted by Joy et al revealed that use of antibiotics usually broad spectrum cephalosporin was high and also showed combination therapies of antibiotics was most followed especially amoxicillin + clavulanic acid combination.[12] Kumar et al revealed that most frequently prescribed antibiotics are higher percentage of patients using cephalosporin's (51.14%) followed by macrolides (17.09%).[13]

In the present study, we have observed that the most commonly prescribed antibiotics were cephalosporins (53.9%), followed by macrolides (26.3%), penicillin (6.1%), tetracyclines (4.2%), lincomycin (3%), fluoroquinolones (2.4 %), oxazolidinones (2.4%), carbapenems (1. 80%), and glycopeptides. All (1.2%). Among the different cephalosporins, ceftriaxone, a third-generation cephalosporin is mostly prescribed and have observed that the average length of stay has found to be less with cephalosporins i.e., 3-6 days than other antibiotics. Additionally, the study found that combination therapy was more frequently used (53%) compared to mono therapy. Among all combination therapies, cephalosporins + macrolides are used in higher percentage (50.9%) followed by penicillin + macrolides (5.45%).

Interpretations

The study provides valuable insights into the usage of antibiotics for RTIs in a multispecialty hospital setting. It reveals that RTIs, including lower and upper RTIs, are prevalent and often require antibiotic treatment. The data shows a higher frequency of antibiotic prescription for RTIs, with cephalosporins being the most commonly prescribed class of antibiotics, particularly ceftriaxone.

This finding suggests that cephalosporins are the preferred choice for treating RTIs in this hospital setting, potentially due to their broad-spectrum activity and

effectiveness against a wide range of respiratory pathogens. Macrolides and penicillin were also frequently prescribed, but to a lesser extent compared to cephalosporins.

The study underscores the importance of appropriate antibiotic selection and prescribing habits to optimize patient care and minimize the risk of adverse outcomes such as antibiotic resistance. Additionally, the observation of higher rates of combination therapy compared to mono therapy highlights the complexity of managing RTIs and the need for tailored treatment approaches

Limitations

Single-center study: The study was conducted in a single multispecialty hospital in Hyderabad, which may limit the generalizability of the findings to other settings with different patient populations and healthcare practices.

Short duration: The study lasted for six months, which might not capture seasonal variations in respiratory infections and antibiotic prescribing practices.

Observational nature: As an observational study, causal relationships between antibiotic prescribing patterns and patient outcomes cannot be inferred.

CONCLUSION

RTIs which are caused by various viruses and bacteria, are a significant contributor to illness and death globally. Antibiotics are commonly prescribed for RTIs in adults and children in primary care. Three quarters of all antibiotic consumption is for RTIs. The main aim of this study is to observe the usage of the various antibiotics for RTIs in a multispecialty hospital.

From this study, it is concluded that the commonly diagnosed disease among RTI in the in-patient pulmonology department was found to be LRTI/ URTI. The most commonly prescribed antibiotics for RTI were cephalosporins ceftriaxone at third generation cephalosporin followed by macrolides, penicillin, tetracyclines, lincomycin, fluoroquinolones, oxazolidinones, carbapenems, glycopeptides. The study concludes that the judicious and careful use of antibiotics can help improve patient care and reduce negative effects like antibiotic resistance, hypersensitivity reactions and respiratory failure in future associated with RTIs.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Kancherla D, Satya Sai MV, Gayathri DHJ, Sharma S. A study on prescribing pattern on antibiotics in respiratory tract infections in a tertiary care centre. Int J Recent Scientific Res. 2015;6(6):4558-63.
2. Mahasur A. Management of lower respiratory tract infection in outpatient settings: Focus on clarithromycin. Lung India. 2018;35(2):143-9.
3. Thomas M, Bomar PA. Upper Respiratory Tract Infection National Library of medicine. StatPearls Publishing. 2024.
4. McLuckie A. Respiratory disease and its management. New York: Springer. 2009;51.
5. Global Initiative for Chronic Obstructive Lung Disease. Gold Report. Chapter 2: Diagnosis and initial assessment. 2021;20-27.
6. Asthma Fact sheet 307. WHO. 2013.
7. Rivera P, Mody GN, Weiner AA. Lung Cancer: Treatment. In Broaddus C, Ernst JD, King TE. (eds.). Murray and Nadel's Textbook of Respiratory Medicine, 7 ed. Elsevier. 2022;1052-65.
8. Waghmode R, Jadhav S, Nema V. The Burden of Respiratory Viruses and Their Prevalence in Different Geographical Regions of India: 1970-2020. Front Microbiol. 2021;12:723850.
9. Errabelly P, Ramavath V, Arshiya A, Alekya S. Analysis of the prescribing patterns of antibiotics in respiratory tract infections at department of medicine at a tertiary care hospital. Int J Pharmacognosy. 2015;6(7):2963-67.
10. NA. Respiratory Tract Infections-Antibiotic Prescribing of Antibiotics for Self-Limiting Respiratory Tract Infections in Adults and Children in Primary Care NICE Clinical Guidelines. 69. 2008.
11. Linder JA, Singer DE. Desire for Antibiotics and Antibiotic Prescribing for Adults with Upper Respiratory Tract Infections. J Gen Intern Med. 2003;18(10):795-801.
12. Joy A, Anand A, Nath AR, Nair MS, Prasanth KG. A Retrospective study on antibiotic usage in a tertiary care hospital. Int J Med Biomed Studies. 2020;4(6):124-8.
13. Kumar CS, Pasupathi AB. Prospective study of antibiotics utilization in pulmonology department in Andhra Pradesh, India. World J Pharmaceutical Res. 2021;11(3):1421-33.

Cite this article as: Gupta N, Singarapu S, Ahmed MI, Pasupuleti H, Fatima S. An ambispective observational study on antibiotics in pulmonology department in a tertiary care hospital. Int J Community Med Public Health 2024;11:1608-11.