



## DRUG UTILIZATION STUDY OF ANTIMICROBIALS IN NON-SURGICAL PATIENTS IN A MULTI-SPECIALITY HOSPITAL

Azher Sharif<sup>1</sup>, Syeda Shama Parveen<sup>2</sup>, Mir Fazil Hassan Ali<sup>3</sup>, Sruthi P<sup>4</sup>,  
Thatikonda Keerthi<sup>5\*</sup>, K. Venkateswarlu<sup>6</sup>

St. Pauls College of Pharmacy, Affiliated to Osmania University,  
Nagarjuna Sagar road, Turkayamjal. Hyderabad- 501510.

\*Corresponding author E - mail: drthatikonda@gmail.com

### ARTICLE INFO

### ABSTRACT

#### Key words:

Anti-microbials, Drug utilisation studies, Cephalosporins.

Access this article  
online Website:  
<https://www.jgtps.com/>  
Quick Response Code:



**Background:** Drug utilization studies are prerequisite for drug policy formulations; they offer methods useful in training and teaching of drug therapies. It is well-known that inappropriate drug use results in effects like drug interactions, ecological disturbance and affects the prognosis. More than 80% of patients admitted to hospital are prescribed with anti-microbials, which in case do not comply with the standard guidelines, leads to increased risk of the anti-microbial resistance. “Drug utilization Studies (DUS) are used in hospital to ascertain the proper use of drugs and to create a sound basis for health-economic and socio-medical studies for healthcare decision making”. **Methods:** This retrospective, prospective observational study was conducted over a period of six months (i.e., from October 2019 to March 2020). The necessary data was collected from inpatient case sheets, outpatient prescriptions and analysed. **Results:** During the study a total of 100 treatment charts were studied. The findings are: more anti-microbials were prescribed to age group 56 to 65 years (30%) followed by age group 66 to 75 years (26%). Males were given more anti-microbials compared to females. Viral fever (19%) was the most common clinical condition for which the anti-microbials were prescribed followed by lower respiratory tract infections (14%) and gastroenteritis (13%). Cephalosporins were the commonly prescribed drug class (76%) followed by fluoroquinolones (27%). Cefoperazone+sulbactam (36%) was the most commonly prescribed drug combination followed by ceftriaxone (30%), clarithromycin (14%). **Conclusion:** Drug utilisation studies should be conducted in all the health care sectors to have unbiased information on the actual drug being used. This gives the health care professionals a chance to check if the prescribing pattern is in accordance with the standard treatment guidelines. Thus, contributing to a better health care and reducing the hazards of drug misuse.

### INTRODUCTION

“Drug utilization studies can be defined as an eclectic collection of descriptive and analytical methods for the quantification, understanding and evaluation of the process of prescribing, dispensing and consumption of medicines, and for the testing of interventions to enhance the quality of these processes”. Drug utilization research is an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug

exposure. Drug use is a complex process. A huge range of socio-cultural elements influence how drugs are used in any country. National drug policy, illiteracy, poverty, the usage of different health-care systems, drug advertising and promotion, sale of prescription drugs without prescription, competition in the medical and pharmaceutical market place and limited availability of independent, unbiased drug

information are all examples in India. Because of the complexities of drug usage, optimal drug therapy advantages in patient care may not be realised due to underuse, overuse, or misuse of medications.<sup>[1]</sup>

Drug utilization studies are a prerequisite for the formulation of drug policies. They also offer guidance for modified teaching methods and for practicing and training in drug therapy. It is well established that indiscriminate drug usage causes undesired side effects, pharmacological interactions, and ecological disruptions, as well as making prognosis worse. Problems with drug storage, delivery, compliance, and selection pose a significant hazard to civilization. Addiction and drug-related disasters are important challenges in today's world. Through competitive sales promotions, manufacturers create false demand for undesired pharmaceuticals and drug combinations. Most of these drugs are accepted by prescribing physicians without full knowledge of their cost, efficacy and safety. Inappropriate medicine use can lead to higher healthcare costs, antimicrobial resistance, side effects, and patient mortality. Hence in recent years studies on drug utilization have become a potential tool to be used in the evaluation of health systems. Drug utilization studies are a powerful tool to know or study the exact role of the drug in the patient's care. They provide a solid socio-medical and health-economic foundation for making healthcare decisions.<sup>[2]</sup>

## **MATERIALS AND METHODS**

The study was a retrospective, prospective observational study; conducted in a 300-bedded tertiary care hospital in Hyderabad for a period of 6 months (October 2019 to March 2020). A suitable data collection form was designed to note down the data needed for the study. The antibiotic prescribing data was collected from the medical records department, treatment charts and prescriptions of all departments except gynaecology, paediatrics and surgical departments. The data of patients of both genders (male and female) and all age groups was included in the study. All the data collected was computerized and analysed by entering into the Microsoft Excel 2010 for easy accessibility, retrieval and

analysis of data. The data was analysed using Microsoft Excel 2010.

## **RESULTS**

During the study period a total of 100 patients were enrolled, majority being males 58 (57.4%) followed by females 42 (41.2%). The ratio between the male and female is 29:21, it indicates that males required antibiotics 1.38 times more than females. Patients with age of 56-65 years (30%) were prescribed more antibiotics, followed by 26-35 years (26%), 66-75 years (13%), 36-45 years (11%). When indications were analysed, 19% were treated for viral fever, 14% were treated for lower respiratory tract infections and 13% were treated for gastroenteritis. The commonly prescribed anti-microbial classes during their hospital stay were Cephalosporins (52.41%), Fluoroquinolones (18.62%), Macrolides (8.27%), Penicillin (7.58%), Carbapenems (2.75%), Aminoglycosides (2.06%), Lincosamide (2.06%) and Rifaximin (0.68). The commonly prescribed classes of anti-microbials at discharge time were Cephalosporins (34.17%), Fluoroquinolones (17.72%), Penicillins (8.82%), Macrolides (8.86%), Carbapenems (7.59%), Rifaximin (5.06%), Tetracyclines (2.53%), Nitroimidazoles (2.53%). Most of them are given by oral route. Most commonly used type of antimicrobials were antibiotics (91.0%) and anti-fungals (2.2%).

The commonly prescribed anti-microbials were Cefoperazone+sulbactam (16.0%) followed by Ceftriaxone (13.3%), Ofloxacin (13.3%), Clarithromycin (6.25%), Amoxicillin+clavulanic acid (5.3%), Cefditoren (4.9%), Cefpirome (3.57%), Piperacillin+tazobactam (2.6%).

## **DISCUSSION**

Our study found that out of 100 patients, majority were males 58 (57.4%) followed by females 42 (41.2%) it was found that the most of the patients treated with antibiotics were of age-group 56-65 years (30%), followed by 26-35 years (26%). According to Akram Ahmed et.al at 2013, Patients with age group 30-60 years were prescribed more antibiotics (48.5%) and patients below age 12 years were given least antibiotics (8.5%).<sup>[3]</sup>

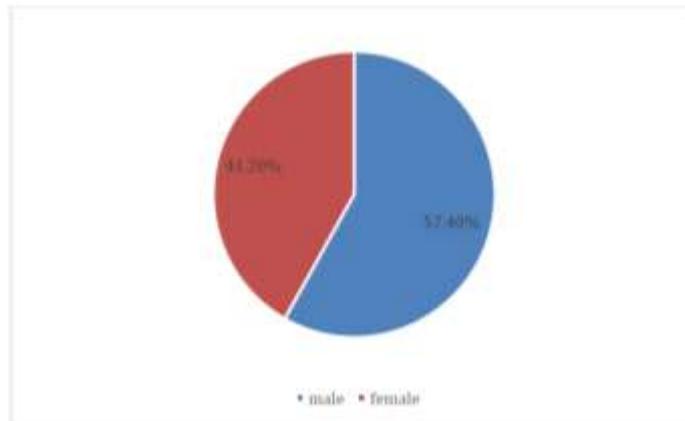


Fig.1 Patients distributed according to gender.

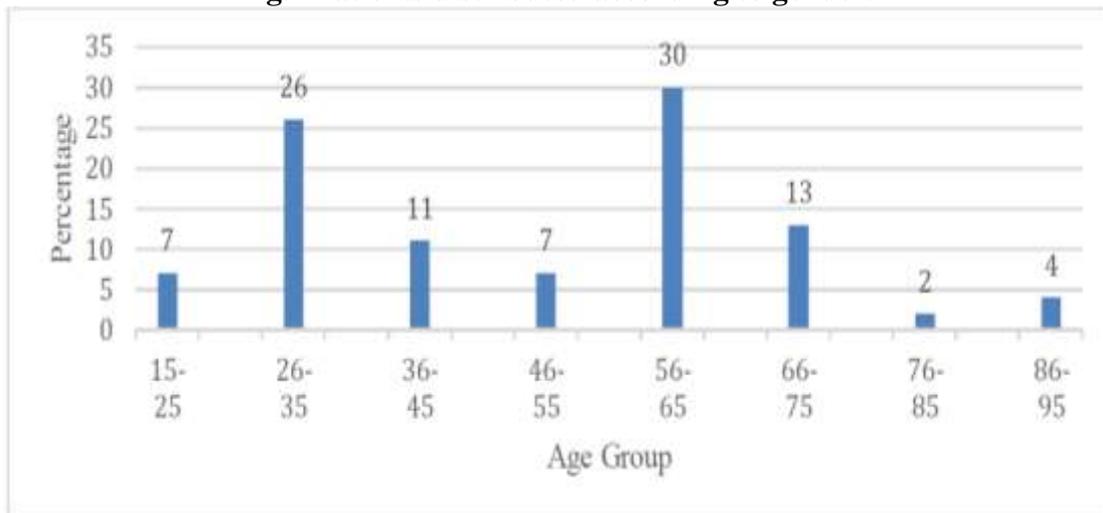


Fig.2: Patients distributed according to age group

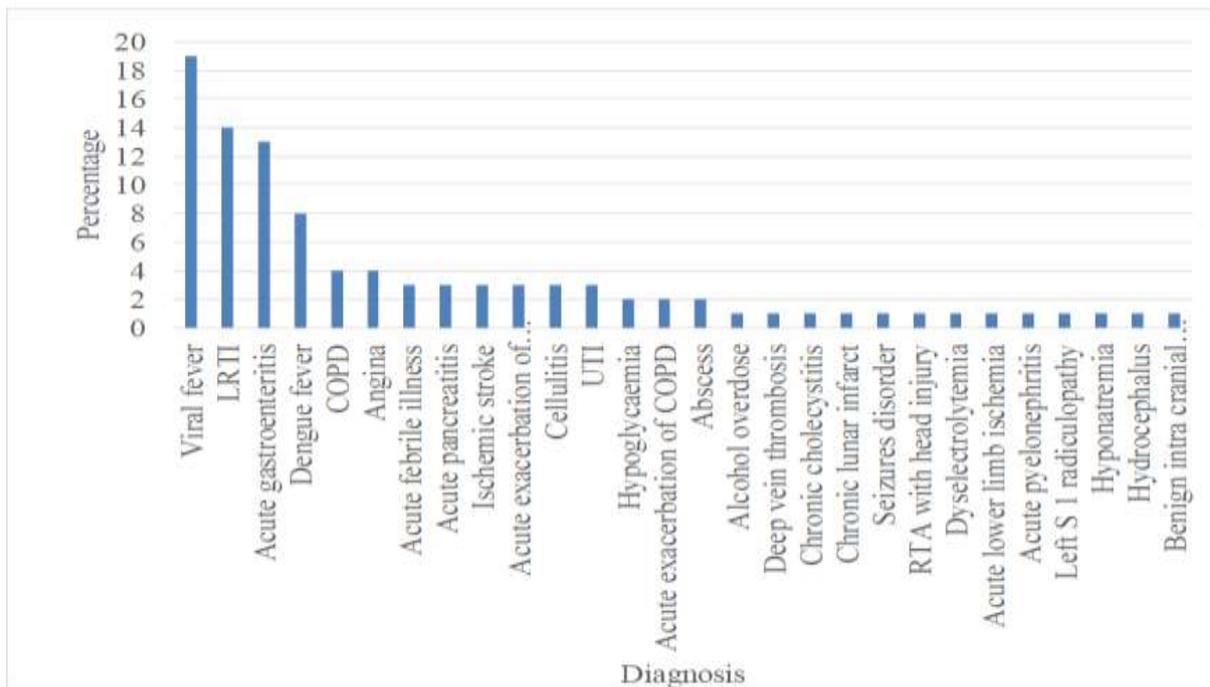
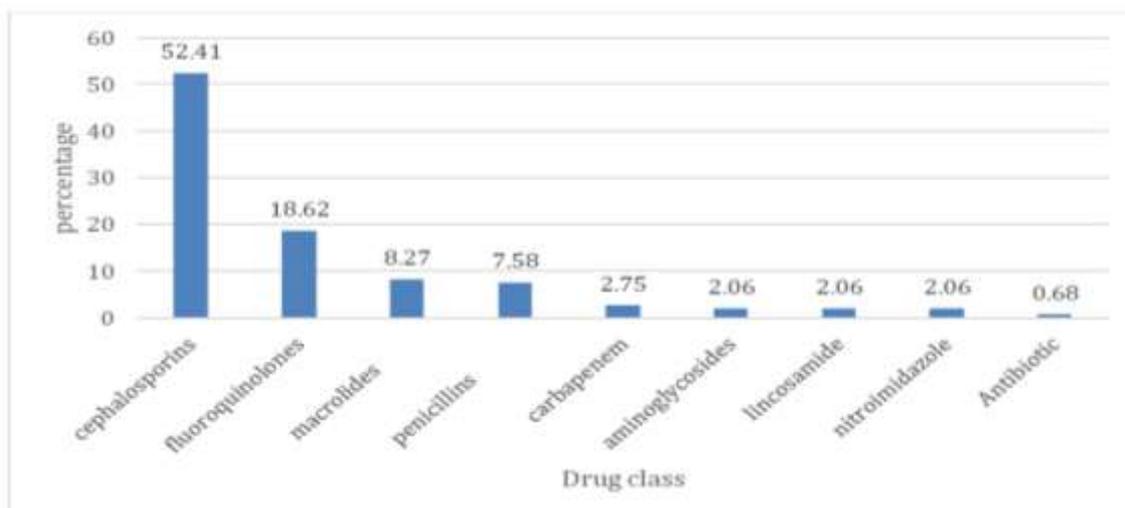
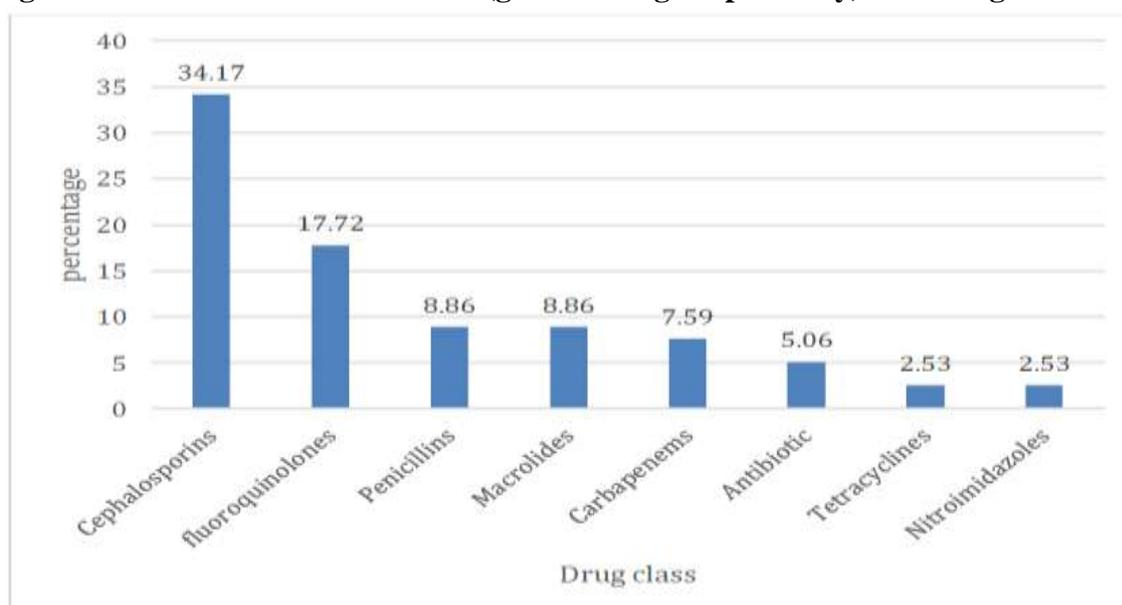


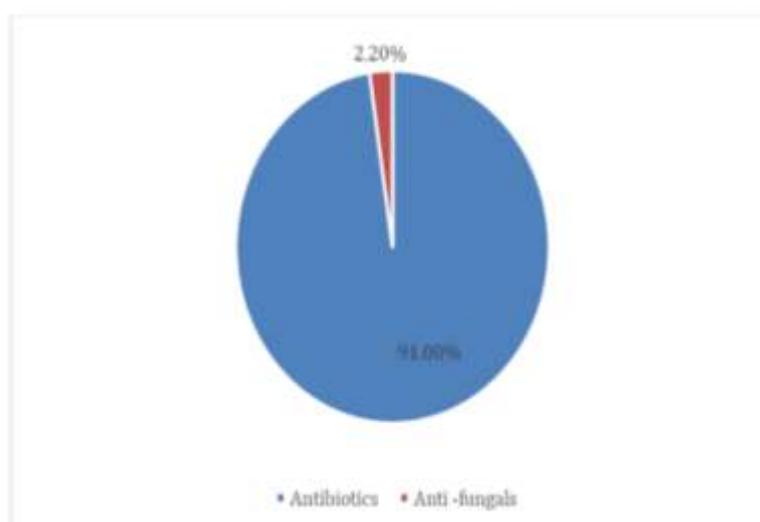
Fig.3: Clinical conditions for which patients were started with antibiotics.



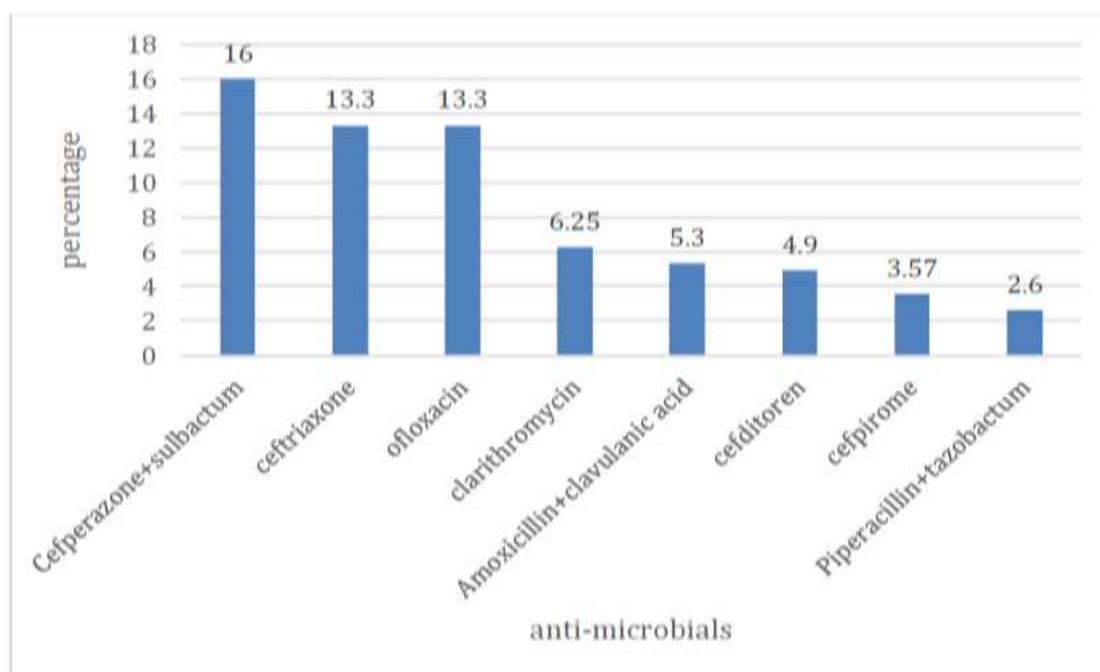
**Fig.4** Distribution of antimicrobials (given during hospital stay) according to their class.



**Fig.5** Distribution of anti-microbials (given at discharge time) according to their class



**Fig.6:** Distribution of anti-microbials based on type and frequency of prescribing



**Fig.7: Distribution of most frequently used anti-microbials**

In our study conducted, it was found that the most common clinical condition for which the antibiotics were prescribed was Viral fever (19%) followed by Lower Respiratory Tract Infections (14%) followed by Gastroenteritis (13%), other conditions like Chronic Obstructive Pulmonary Disease, Acute Febrile Illness etc. According to Siavash Shahbazi Nia et.al at 2018, antibiotics were commonly prescribed for viral fever, LRTIs, gastroenteritis followed by COPD, pancreatitis, cellulitis.<sup>[4]</sup> Our study found that the most commonly prescribed antimicrobial class was cephalosporins (52.1%), fluoroquinolones (18.62%), and macrolides (8.27%). According to Siavash Shahbazi Nia et.al at 2018, the most commonly prescribed class of antimicrobials were cephalosporins (91.4%), followed by fluoroquinolones (28.7%) and anti-fungals (26%).<sup>[5]</sup> From the present study it was also found that the most prescribed drugs classes at the time of discharge were Cephalosporins (34.17%), followed by fluoroquinolones (17.72%) The most prescribed anti-microbial was found to be Cefoperazone+sulbactam (16%), then ceftriaxone (13.3%), ofloxacin (13.3%), clarithromycin (6.25%). Dario Martolini et al at 2014 states that the most prescribed anti-microbials are Cefoperazone+sulbactam

(27.4%), ceftriaxone (21%), fluoroquinolones (18.9%).<sup>[5]</sup>

**FUTURE DIRECTIONS:** The study should be carried out in wide range of population, for long period of time. The study should be interventional type. People should be made aware of the usage of antibiotics and its resistance.

#### LIMITATIONS

- It is an observational study.
- Study was single centred, conducted in less number of population and over a little time period.

**ACKNOWLEDGEMENT:** Authors are thankful to the management of St. Pauls college of Pharmacy for constant support and encouragement.

**CONTRIBUTION:** All authors have contributed in conception and design, acquisition of data, collection and assembly of data.

**CONFLICT OF INTEREST:** The authors declare that there is no conflict of interest.

**NOVELTY OF WORK:** The following are our findings: Most of the patients prescribed with antibiotics were in the age group of 56-65 years. Males require more antibiotics. Most antimicrobials were prescribed for viral fever. Antibiotics were used more compared with other antimicrobials. Cephalosporins were the most commonly prescribed drug class.

## **CONCLUSION**

During the study, unbiased information on the common age group, gender more prescribed, common clinical conditions, most commonly used anti-microbial drug class and drugs were observed and stated and we conclude that drug utilisation studies should be conducted in all the health care sectors to have an unbiased information on the actual drug being used. This gives the health care professionals a chance to check if the prescribing pattern is in accordance with the standard treatment guidelines. Thus, contributing to a better health care and reducing the hazards of drug misuse.

## **REFERENCES**

1. Mrs. P D Sachdeva, Dr. B G Patel. Drug Utilization Studies- Scope and Future Perspectives, International Journal on Pharmaceutical and Biological Research. (2010) 1(1):11-17.
2. S. C. Pradhan, D. G. Shewade, C. H. Shashindran, I. S. Bapna, Drug utilization studies, The National Medical Journal of India. (1988) 1(4):185-188.
3. Akram Ahmed, Study the prescription pattern of antibiotics in the medicine department in a teaching hospital, International journal of toxicological and pharmacological research (2013) 06(02): 43-46
4. Siavash Shahbazi Nia, Shoba Rani R, Hiremath, Shankar Prasad. Assessment of Antimicrobial Use pattern using World Health Organization prescribing indicators at a tertiary hospital: A prospective, observational study. Journal of applied Pharmaceutical Sciences June (2018) 8(06): 132-138
5. Abigail fraser et.al. Benefit of appropriate empirical antibiotic treatment: third day mortality and duration of hospital stay. The American journal of medicine. Nov (2006) 119(11):970-976.