

## To obtain information about prescribing pattern of antibiotics: a prospective hospital based observational study

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### Abstract

**Objective:** To obtain information about prescribing pattern of antibiotics in the tertiary care teaching hospital. **Methods:** The present prospective hospital based observational study was conducted among patients admitted to inpatient department of General Surgery, Sri Krishna Medical College and Hospital, Muzaffarpur, India from April 2019 to October 2019. Patients above 18 years of either sex were included in the study. **Results:** A total of 138 prescriptions were studied. Mean age of the study population was 38.16 years. Mean number of medicines prescribed per prescription was 4.69 and mean number of antibiotics per prescription was 2.18. **Conclusion:** Cephalosporin was the preferred or most prescribed choice of drug for prophylaxis followed by penicillin's. Our study brings to the fore some common but serious lapses in antibiotic prescription patterns and emphasizes the need for proper and appropriate use of antibiotics.

**Keywords:** Antibiotics, Post-Surgery, Prescription pattern, Resistance.

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### Introduction

Growing economic prosperity and rising incomes, as well as expanding insurance coverage, have increased antibiotic consumption[1]. Irrational antibiotic usage can lead to increased healthcare utilization, morbidity, mortality, adverse drug events and antimicrobial resistance.[1]In India the prevalence of antibiotic use ranges from 24 to 67%[2].

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The high infectious disease burden, poor living conditions and easy availability of antibiotics are some of the major drivers of rising antibiotic consumption and multi drug resistance.[1,2]

Realization of grave consequences of antibiotic resistance has forced the different stake holders and policymakers to adopt a multi pronged approach to combat the menace of antibiotic resistance and antibiotic stewardship constitute an important part of that[1].

Drug utilization research was defined by the World Health Organization (WHO) in 1977 as “the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences.” Drug utilization studies

help to understand and improve the prescribing as well as drug usage[1].

Prescribing skill reflects prescriber's knowledge, attitude and practice towards diagnosis and management of diseases. Drug utilization study is a great tool for analyzing and evaluating prescribing pattern of medical professionals and also helps in formulating drug and antibiotics policy[3].

Hence the aim of this study was to obtain information about prescribing pattern of antibiotics in the tertiary care teaching hospital[4-7].

### Materials and methods

The present prospective hospital based observational study was conducted among patients admitted to inpatient department of General Surgery, Sri Krishna Medical College and Hospital, Muzaffarpur, India from April 2019 to October 2019

### Inclusion Criteria

1. Patients above 18 years of age of either sex
2. Who give informed consent

The study protocol was reviewed by the Concerned Ethical Committee and was granted ethical clearance. After explaining the purpose and details of the study, a written informed consent was obtained

### Sample selection

### Results

**Table 1: Demographic profile**

Age (years)	38.16±3.81
Gender (M/F)	98 (71.0%) /40 (28.9%)
Duration of Hospital stay (Days)	5.27±1.18
Mean number of medicines prescribed per prescription	4.69±0.98
Mean number of antibiotics prescribed per prescription	2.18±0.18
Antibiotics given Orally	26 (18.8%)
Antibiotics given in Inject able form	112 (81.2%)

**Table 2: Distribution of diagnosed diseases**

Diagnosis	N (%)
Cellulitis	37 (26.8%)
Hernia	31 (22.5%)
Diabetic Foot Ulcer	29 (21.0%)
Abscess	18 (13.0%)
Appendicitis	14 (10.1%)
Others	9 (6.5%)

The sample size was calculated using a prior type of power analysis by G\* Power Software Version 3.0.1.0 (Franz Faul, Universitat Kiel, Germany). The minimum sample size was calculated, following these input conditions: estimated prevalence of 40%, power of 0.80 and  $P \leq 0.05$  and sample size arrived were 120.

### Methodology

Patient profile forms consisting of demography, etiology, history, diagnosis, antibiotic drug therapy of the patients was collected. Evaluation of the data of antibiotic utilization was done using suitable standard treatment guidelines such as Scottish Intercollegiate Guidelines Network (SIGN), American Society of Health-System Pharmacists (ASHP) guidelines, and Infectious Diseases Society of America (IDSA) guidelines.

### Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages and means. The statistical test applied for the analysis was independent sample t-test. The confidence interval and p-value were set at 95% and  $\leq 0.05$  respectively.

**Table 3: Distribution of prescribed antibiotics**

Antibiotics	N (%)
Cephalosporins	83 (60.1%)
Penicillins	72 (52.2%)
Aminoglycosides	67 (48.5%)
Fluoroquinolones	52 (37.7%)
Carbapenems	39 (28.3%)
Macrolides	28 (20.3%)
Others	11 (7.9%)

### Discussion

Patients in surgical ward develop infections post-surgery; many of the infections are caused by bacteria's that are highly virulent. The use of antibiotics in surgical patients both for prophylaxis and treatment of infections is a justifiable practice that however requires a regular review of the chosen regimen on the grounds of efficacy, diagnosis pattern, prescribing pattern and the aspects to maximize the benefits to the patients[8-10]

It was observed that in the present study, mean number of medicines prescribed per prescription was 4.69 as compared to 3.53 medicines per prescription reported by Pradeepkumaret al. Further, in our study, it was found that the mean number of antibiotics per prescription was 2.18 as compared to 2.16 per prescription reported by Narayan and Mangesh[11]

In the present study the cases were classified into their systemic surgical procedure, i.e., Skin and soft tissue surgery procedures accounts for the highest number followed by of general surgical category, gastrointestinal surgical procedures, urinary systems and head-neck surgeries. Similar study conducted on antibiotics prescribing pattern in surgical wards found appendicitis 23.04%, diabetic foot ulcers 29.78%, and hernia 21.27%. Some of other studies also have major account for appendicitis and hernia in India

Another study conducted in tertiary care hospital of South India which showed cephalosporins and penicillins were the most commonly prescribed groups of antibiotics Cephalosporin is a very important class of drugs which have been prescribed extensively as an antimicrobial in the treatment of acute and chronic bacterial infection. They have been very successful in treating and controlling infections. However, there are growing numbers of reports of resistance to these agents with increasing use. Cephalosporin's usage pattern exerts a significant influence over the rates of resistance observed and led to problematic multidrug resistant nosocomial pathogens[12-14]

Possible limitations of the present study include the small sample size (more studies involving large

population are required) and the lack of inclusion of patients from outpatient department. Despite the limitations in our study, strength of the study is that it has generated baseline data for comparison with similar studies at state, national, and international level and similar type of studies in the future at this institution. It is evident that this study will help to establish antimicrobial prescribing guidelines in a tertiary care set up and will boost rational prescribing.

### Conclusion

The worldwide increase in antibiotic resistant bacteria of great concern and it is the responsibility of the clinician to develop good and responsible prescribing habits which will help in reducing the intensity of the problem. The present study concluded that cephalosporin was the preferred or most prescribed choice of drug for prophylaxis followed by penicillin's. Our study brings to the fore some common but serious lapses in antibiotic prescription patterns and emphasizes the need for proper and appropriate use of antibiotics

### References

1. Masiero G , Filippini M, Ferech M, Goossens H. Socioeconomic determinants of outpatient antibiotic use in Europe. Int J Public Health 2010; 55(5):469-78 .
2. Rehana HS, Nagarani MA, Rehan M. A study on the drug prescribing pattern and use of antimicrobial agents at a tertiary care teaching hospital in eastern Nepal. Indian J Pharmacol. 1998;30:175-80.
3. Ahmad A, Revanker M, Haque I, Pravina A, Ivan R, Dasari R, et al. Study the Prescription Pattern of Antibiotics in the Medicine Department in a Teaching Hospital: A Descriptive Study. IJTPR. 2014;6(2):43-6.

4. Laxminarayan R and Chaudhury RR. Antibiotic resistance in India: drivers and opportunities for action. PLoS Med 2016; 13: e1001974.
5. Laxminarayan R, Matsoso P, Pant S, et al. Access to effective antimicrobials: a worldwide challenge. Lancet 2015; 387: 168–175.
6. Mac Dougall C, Polk RE. Antimicrobial stewardship programs in health care systems. Clin Microbiol Rev. 2005;18:638-656
7. World Health Organisation. Introduction to Drug Utilization Research. Geneva: World Health Organisation; 2003.
8. Fishman ON. Antimicrobial Stewardship. Am J Med. 2006; 119(6A):53-6
9. Abula T, Kedir M. The pattern of antibiotic usage in surgical in-patients of a teaching hospital, Northwest Ethiopia. Ethiop J Health Dev 2004;18(1):35-8.
10. Pradeepkumar B, Alameri T, Narayana G, Reddy YP, Ramaiah JD. Assessment of antibiotic prescribing pattern in pediatric patients: A cross-sectional hospital-based survey. Chrismed J Health Res 2017;4:235-7.
11. Narayan DS, Mangesh MM. A study of prescription pattern of antibiotics in paediatric in-patients at a tertiary care hospital in central India. Int J Pharmacol Res 2016;6:286-90.
12. Kumar BA, Adiveni T, Chandra DS, Charan N, Padmini P, Ashwini K, et al. Study and use of antimicrobials in post-operative wound infections in gastrointestinal surgeries. Indo Am J Pharm Res 2013;3(4):1-5.
13. Pandiamunian J, Somasundaram G. A study on prescribing pattern of anti microbial agents in the medical intensive care unit of a tertiary care teaching hospital in Puducherry Union Territory, South India. Int J Pharm Pharm Sci 2014;6(3):235-8.
14. Kheder S. Cephalosporins usage and resistance trend in a sudanese hospital surgical wards. J Pharm Biomed Sci 2011;11(3):1-6.

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