

Prospective observational study on prescription pattern of antibiotics in general ward and intensive care unit in tertiary care hospital

Isha Dharmendrabhai Joshi ^{1,*}, Ayushi Devendrasinh Solanki ^{1,*}, Neelsinh Pravinsinh Chauhan ¹, Pallavi K. J ¹ and Darshan Trivedi ²

¹ Department of Doctor of Pharmacy at Shree Dhanvantary pharmacy college, kim 394111, Gujarat, India.

² Department of Intensive care unit of kiran multi super speciality hospital, katargam, Surat,395004, Gujarat, India.

World Journal of Biology Pharmacy and Health Sciences, 2023, 14(03), 042–052

Publication history: Received on 23 April 2023; revised on 03 June 2023; accepted on 06 June 2023

Article DOI: <https://doi.org/10.30574/wjbphs.2023.14.3.0233>

Abstract

The prescription pattern monitoring facilitate the rational use of drugs in the population. Rational use of drug means patients receive medication appropriate to their clinical needs in doses that meet the individual requirement for an adequate period of time and at an economical price to the individual and overall to the community. Role of Right medicine in the Right manner in the Right patients must be followed while using Antibiotics. Irrational use of medicines is major problem worldwide. WHO estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately and that half of all patients fail to take them correctly. The overuse, underuse or misuse of medicine result in wastage of scarce resource and widespread health hazards. Therefore, appropriate and safe use of antibiotics in healthcare system is more Important. The main objective of the study was to determine the percentage of antibiotics used in general ward and in intensive care unit and to find out most commonly Prescribed antibiotic within 72 hours in intensive care unit, the most common microorganism found in culture sensitivity test and the common route of drug administration in general ward and in intensive care unit. This is a prospective observational study. The study was conducted in tertiary care hospital in Gujarat. The duration of the study was 6 months. Total of 120 patients data was collected from the patient case sheet. Prescription of the patients are collected in designed CRF form and relevant data is analysed to obtain frequency and percentage. Out of 120 patients, majority of patients were male and most commonly used route of administered was Iv. The commonly prescribed antibiotics in general ward was ceftriaxone 28 (29.43%), metronidazole 10 (10.53%), cefoperazone + sulbactam 10 (10.53 %) and Amoxicilin + clavulanic acid 7 (7.37 %) prescribed for different condition. In Intensive care unit, commonly prescribed antibiotics was ceftriaxone 19 (18.1 %), meropenem 15 (14.29 %) and Cefoperazone + sulbactam 12 (11.44 %). On Discharge Time most of the patients was still on antibiotics therapy. This study analysed 120 prescription and ceftriaxone, cefoperazone + sulbactam, amoxicillin + clavulanic acid, meropenem, cefadroxil, vancomycin, cefepime + tazobactam piperacilin + tazobactam, doxycycline Cefixime are the hospital formulary. Prescription pattern studies have become a potential tool for evaluating the health care System. This study provides important baseline information on antibiotics use. This study severs to spotlight the current prescribing trends in patients. The use of a single agent and the combination of antibiotics were dependent upon the hospital formulary and protocols and policies for antibiotic use.

Keywords: Antibiotics; Prescription pattern; ICU; General ward; Culture sensitivity

1. Introduction

Antibiotics are most frequently prescribed drugs among hospitalized patients especially in medical and surgical wards. Programs designed to encourage appropriate antibiotic prescription in health institutions is an important element in quality of care, infection control and cost containment¹. Antibiotics are medications that save countless lives by treating

* Corresponding author: Isha Dharmendrabhai Joshi and Ayushi Devendrasinh Solanki.

bacterial infections. Medications work by selectively killing or blocking the disease causing microorganisms, destroying or inhibiting their growth

Antibiotic resistance is prevalent problem, it is becoming more common as result of improper antibiotic use and prescription. Most common reason for irrational drug use are self medication, polypharmacy, inappropriate antibiotics use, abuse of intractable pharmaceutical and medication not prescribed according to some clinical guidelines. Antibiotics resistance to be controlled if antibiotics used wisely and practical antibiotic use is associated with rational antibiotic use².

Study of prescription pattern helps to monitor, evaluate and suggest modification in practitioner prescribing habit so as to make medical care rational and cost effective. Information about antibiotic use patterns is necessary for a constructive approach to problem that arise from multiple antibiotics available¹. Antibiotics prescribing with respect to the dosage, frequency and guidelines for appropriate and inappropriate prescription may cause an increase in resistance and overuse or underuse of medication cause increase in cost and decrease in outcome of therapy³.

The present study would help to monitor and evaluate the prescribing pattern in general ward and Intensive Care Unit in a tertiary care hospital in Gujarat.

2. Material and methods

2.1. Inclusion Criteria

Patient data from both genders with age more than 18 years were considered. Patient who directly admitted in ICU for first 72 hour was considered. Patient who are freshly admitted in general ward from the time of admission to discharge also considered

2.2. Exclusion Criteria

Pregnant women and cancer patient, patient with less than 18 years of age was excluded. Mentally retard Patient, MLC cases and patient who are transferred from other hospitals was excluded from the study.

2.3. Study Design and sample size

It is a prospective observational study and sample size was 120.

2.4. Study duration

The duration of study was 6 months.

2.5. Methodology

The study was conducted in accordance with the ICH-GCP guidelines. The important documents such as protocol, data collection form like ICF, CRF was presented to the SDPC ethics committee for approval of the same. The study proceeded after the permission was granted. The study was prospective and observational. The study was conducted at a Multi Speciality Hospital in Surat. The patient who was prescribed antibiotics was only considered for analysis of prescription. The main aim was to study on prescription pattern of Antibiotics in general ward and intensive care unit in tertiary care hospital.

2.6. Procedure

The study was conducted at hospital the patients who was prescribed antibiotics was only considered for analysis of prescription.

From the patient's case sheet different information like demographics parameters, medication chart information, lab reports, culture sensitivity and No. of antibiotics all the collected and entered in CRF.

Based on our need of study CRF was prepared and approved CRF consist of:

- Demographic details
- Laboratory parameters
- No of antibiotics

- Culture sensitivity test report
- On discharge time patient Still on antibiotics or not.

2.7. Statistical analysis

The collected data was segregated based on Gender, route of administration, use of no of antibiotics, culture sensitivity report, which microorganism found and before discharging patient was still on antibiotic prescription or not. All this details were included in CRF and from this master chart.

Statistical analysis was Done by finding out the finding the Frequency and determining the percentage of antibiotics prescribed in both general ward and ICU.

3. Results

3.1. General ward

3.1.1. Frequency And Percentage Of Antibiotics Prescribed In General Ward

The prospective observational study conducted in 60 patients in general ward. According to this result we found that majority of the population include male 36 (60%) and female 24 (40 %). According to prescription most commonly antibiotics were prescribed ceftriaxone 28 (29.48 %), Metronidazole 10 (10.53%), Cefoperazone + sulbactam 10 (10.53 %), Amoxicillin + clavulanic acid 7 (7.37 %) in general ward .

Table 1 Frequency And Percentage Of Antibiotics Prescribed In General Ward

Antibiotics name	Frequency	Percentage
Amoxicilin + clavulanic acid	7	7.37%
Amphotericin B	1	1.05%
Azithromycin	1	1.05%
Cefadroxil	1	1.05%
Cefepime	1	1.05%
Cefepime + tazobactam	1	1.05%
Cefexime	1	1.05%
Cefoperazone + sulbactum	10	10.53%
Cefotaxime	5	5.26%
Cefotaxime + sulbactum	1	1.05%
Cefpodoxime proxetil + clavulanic acid	1	1.05%
Ceftriaxone	28	29.48%
Cefuroxime	2	2.11%
Cefuroxime+ sulbactum	1	1.05%
Cefuroxime axetil	4	4.22%
Ciprofloxacin + Tinidazole	2	2.11%
Levofloxacin	3	3.16%
Linezolid	2	2.11%
Meropenem	4	4.22%
Metronidazole	10	10.53%
Moxifloxacin + dexamethasone	1	1.05%

Piperacilin + Tazobactum	1	1.05%
Rifaximin	1	1.05%
Teicoplanin	1	1.05%
Ticarcilin	1	1.05%
Tigicycline	1	1.05%
Tobramycin	1	1.05%
Vancomycin	1	1.05%
Total	95	

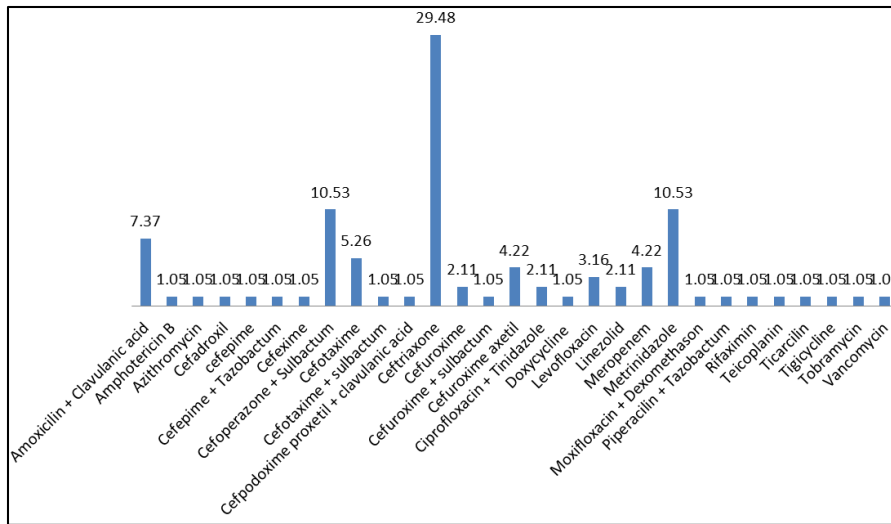


Figure 1 Frequency and percentage of antibiotics prescribed in general ward

3.1.2. Frequency and Percentage Of Route Of Administered In General Ward

According to this Result most commonly Routes are use IV 79 (83 %) in patients.

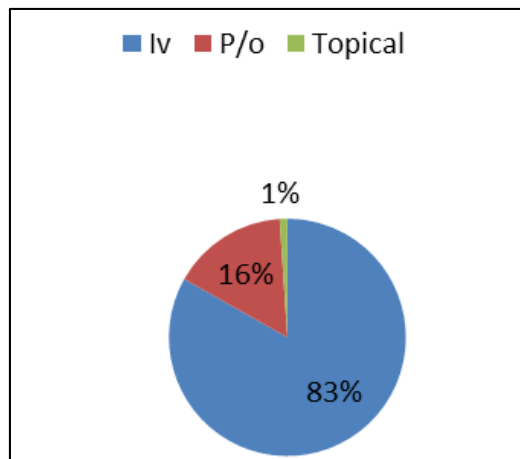


Figure 2 Frequency and percentage of route of antibiotic administered in general ward

Table 2 Frequency and percentage of route of antibiotic administered in general ward

Route	Frequency	Percentage
IV	79	83%
PO	15	16%
Topical	01	1%
Total	95	

3.1.3. Frequency and Percentage Of Microorganism Found In General Ward

The culture sensitivity test carried out in 7 patients. In that most commonly found microorganism was e.coli.it frequency was 2 (3.33%) .

Table 3 Frequency and percentage of microorganism found in general ward

Microorganism	Frequency	Percentage
E-coli	2	3.33 %
Insignificant Bacteria	1	1.67 %
S.aureus	1	1.67 %
Spp.Isolated	1	1.67 %
Culture sensitivity not performed	55	91.66 %
Total	60	

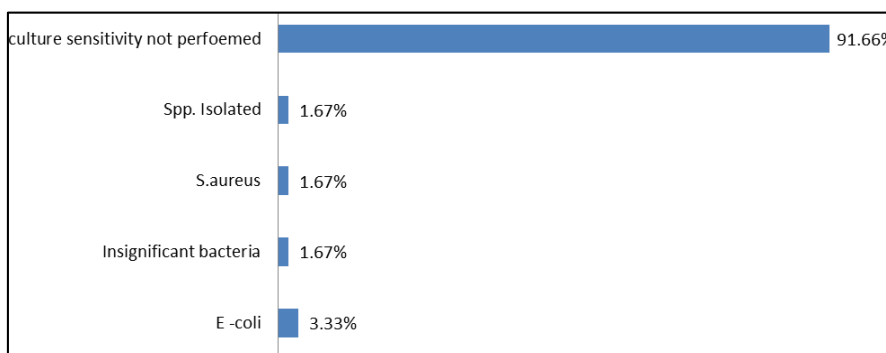


Figure 3 Frequency and Percentage of micro-organism found in general ward

3.1.4. Antibiotics during Discharge Time In General Ward

At the time of discharge 59 (98.33%) patients were still on Antibiotic Therapy.

Table 4 Antibiotic during discharge time in general ward

On discharge still on antibiotics or not	Frequency	Percentage
Yes	59	98%
Death	01	02%
Total	60	

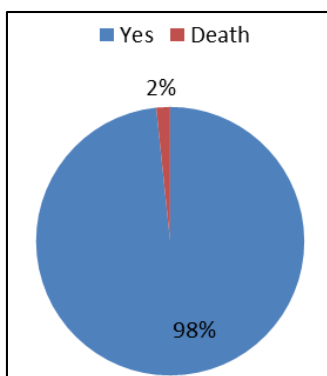


Figure 4 Antibiotic during discharge time in general ward

3.2. Intensive Care Unit

3.2.1. Frequency and Percentage Of Antibiotics Prescribed In ICU

Table 5 Frequency and percentage of antibiotics prescribed in ICU

Antibiotics name	Frequency	Percentage
Amoxicilin + Clavulanic Acid	5	4.76%
Ampicilin + sulbactum	1	0.95%
Azithromycin	3	2.86%
Cefadroxil	10	9.52%
Cefepime + Tazobactum	1	0.95%
Cefoperazone + Sulbactum	12	11.44%
Ceftriaxone	19	18.1%
Clindamycin	1	0.95%
Doxycycline	1	0.95%
Fosfomycin	1	0.95%
Fosfomycin Tromethanol	1	0.95%
Levofloxacin	4	3.81%
Linezolid	7	6.67%
Meropenem	15	14.29%
Metronidazole	8	7.62%
Minocycline	1	0.95%
Piperacilin + Tazobactum	5	4.76%
Rifaximin	1	0.95%
Teicoplanin	4	3.81%
Tigicycline	1	0.95%
Vancomycin	4	3.81%
Total	105	

According to this result we found that majority of the population include male 38(63%) and female 22 (37 %).According to prescription most commonly antibiotics were prescribed ceftriaxone 19 (18.1%), meropenem 15 (14.29

%),cefoperazone + sulbactam 12 (11.44 %) and cefadroxil 10 (9.52 %). On discharge time patients whose still on antibiotics was 41 (68 %)

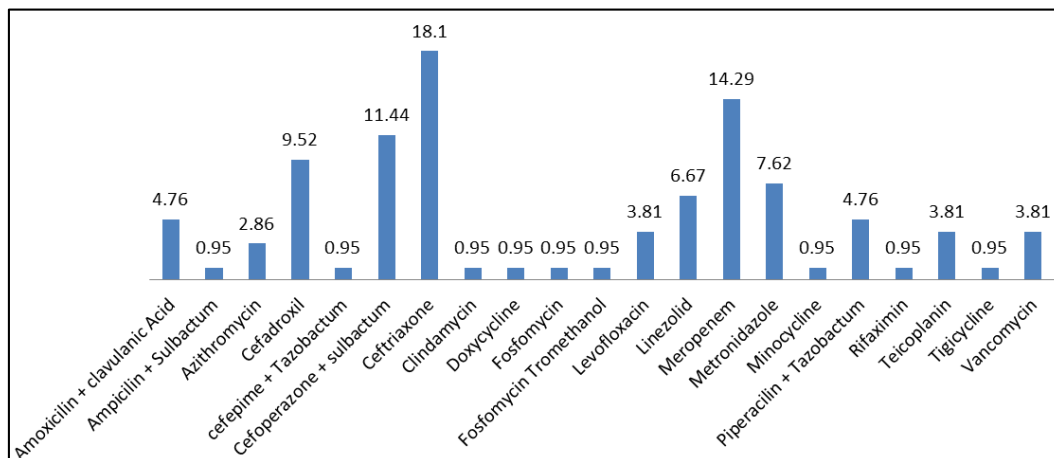


Figure 5 Frequency and percentage of antibiotics prescribed in ICU

3.2.2. Frequency and percentage of route of antibiotics administered in ICU

According to this result most commonly route was IV 85 (81 %) use.

Table 6 Frequency and percentage of route of antibiotics administered in ICU

Route	Frequency	Percentage
IV	85	81 %
PO	20	19 %
Total	105	

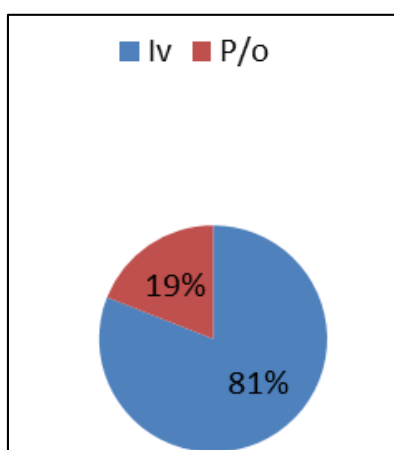


Figure 6 Frequency and percentage of route of antibiotics administered in ICU

3.2.3. Frequency And Percentage Of Microorganism Found In ICU

The culture sensitivity test carried out in 10 patient. In that most commonly found microorganism was e.coli.it frequency was 3 (5 %).

Table: 7 Frequency and percentage of microorganism found in ICU

Microorganism	Frequency	Percentage
Candida Topicals	1	2%
E Coli	3	5%
Galactomannan	1	2%
Klebsiella Pneumoniae	2	3%
S. Aureus	2	3%
Streptococcus nitis group	1	2%
Culture sensitivity not performed	50	83%
Total	60	

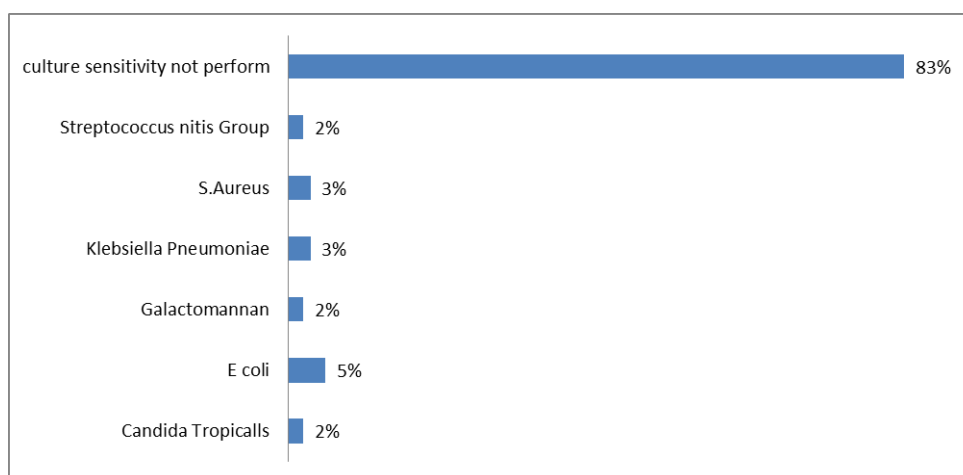


Figure 7 Frequency and percentage of microorganism found in ICU

3.2.4. Antibiotics During Discharge Time In ICU

At the time of discharge (68 %) were still on Antibiotic Therapy.

Table 8 Antibiotics during Discharge Time in ICU

On discharge still on antibiotics or not	Frequency	Percentage
Yes	41	68%
No	12	20%
Death	7	12 %
Total	60	

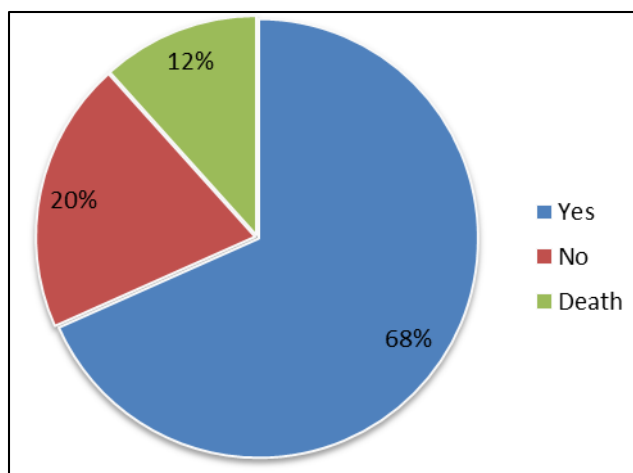


Figure 8 Antibiotics during Discharge Time in ICU

4. Discussion

Our study was designed as prospective observational study and we included the data of 120 patients from the time period of November 2021- February 2022. The study was conducted to observe the prescription pattern of antibiotics in general ward and intensive care unit in kiran multi – super speciality hospital, surat. We have enrolled 200 patients but we included 120 patient according to our inclusion and exclusion criteria.

We have include the patients who receive at least one antibiotics in their prescription. In general ward, we have concluded that out of 60 patients male patients found to be 36 (60%) included more than female patients. In this study most commonly route of antibiotics administered was IV 79 (83%). In culture sensitivity test was done in 7 (11.67%) patients and culture sensitivity Not Done in 53 (88.33%) patients. On the basis of culture sensitivity result most common micro-organism found E coli 2 (3.33%). According to prescription most commonly antibiotics were prescribed ceftriaxone 28 (29.48%), Metronidazole 10 (10.53%),Cefoperazone+ sulbactum 10 (10.53%),Amoxicillin + clavulanic acid 7 (7.37%) in general ward . On discharge time patients whose still on antibiotics was 59 (98.33%) and one patients who was death in general ward.

In ICU, we have concluded that out of 60 patients male patients found to be 38 (63%) included more than female patients. In this study most commonly route of antibiotics administered was IV 85 (81%). In culture sensitivity result test was done in 7 (11.67%) patients and culture sensitivity not Done in 16 (73%) patients. On the basis of culture sensitivity result most common micro-organism found E-coli 3 (5%). According to prescription most commonly antibiotics were prescribed Ceftriaxone 19 (18.1%), Meropenem 15 (14.29%), Cefoperazone + Sulbactum 12 (11.44%) and Cefadroxil 10 (9.52%). On discharge time patients whose still on antibiotics was 41 (68%), patients who still not antibiotics was 12 (20%) and seven (12%) patients who was death in ICU.

Abbreviations

- **ICU** : Intensive Care Unit
- **WHO**: World Health Organization

5. Conclusion

This study analysed 120 prescription and found that physician used the drug form the hospital formulary. Prescription pattern studies have become a potential tool for evaluating the Health care System. This study provide important baseline Information on Antibiotics use. This study severs to spotlight the current prescribing trends in patients. The use of single agent and the combination of antibiotics were dependent upon the hospital formulary and protocols and policies for antibiotics use.

Compliance with ethical standards

Acknowledgments

We acknowledge the hospital, its staff, our university and our college faculty for their support. We would like to convey our gratitude towards Dr. Pallavi K.J., Head of Department, Dr. M. N. Noolvi, Principal, Shree Dhanvantary Pharmacy College, Kim and Dr. Shwetha Swaminathan without whose efforts our project would not have been possible.

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors'.

Statement of informed consent

The study did not require to take consent from the subjects as it only took subject's data into consideration.

Author's Contribution:

Isha, Ayushi and Neel for designing and conducting study, analyzing data, interpreting result and drafting manuscript. Dr. Pallavi and Dr. Darshan were involved in supervision of study and its critical review. Final approval of the version to be published is given by all the authors.

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