

## STUDY ON PRESCRIBING PATTERNS OF ANTIBIOTICS USED IN THE MANAGEMENT OF VARIOUS INFECTIOUS DISEASES IN ANDRAPRADESH

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### ABSTRACT

This study examined the pattern of physicians' prescription of antibiotics and its possible effects on infectious diseases as well as physicians' compliance with recommended guidelines. Records of 110 patients (67 males and 43 females) aged 20-89 years (mean: 52.6±14.6) and patients suffering with various Infectious diseases at Krishna Institute of Medical Sciences, over a period of 9 months were randomly selected. Information on antibiotics prescriptions was recorded. The patients were distributed into different age groups. Patients less than 18 years were excluded from the study.

Of the 110 patients studied, 6.3% (07) were on monotherapy and 92.7% (102) on combination therapy. Of the patients on combination therapy, 51.81% (57), 34.54% (38) and 6.3% (07) were on 2, 3 and more than three drugs, respectively. The present study reveals that, Dual therapy Cilastin+Imipenem combination was maximally used in the management of various types of Infectious diseases. In triple therapy Ceftriaxone was used frequently along with Cilastin and Imipenem combination, Likewise 57.14 percent of Piperacillin+Tazobactam combination was used with Cilastin+Imipenem combination in patients taking more than three antibiotics.

Our results are consistent with the previously observed benefits of antibiotics combination therapy, and demonstrate an apparent higher efficacy of Cilastin+Imipenem monotherapy than dual therapy in various infectious diseases in the study population. Major limitations of this work include its retrospective nature and the inability to determine the actual patients' adherence to therapy

**KEY WORDS:** Prescribing pattern, Cilastin, Imipenem, infectious diseases.

### INTRODUCTION

The discovery of compounds with antimicrobial activity was a major advancement in medicine and patient care. These compounds provide doctors with an adjunctive therapy to patients own immune system the principal and perhaps best defense for fighting infectious diseases.<sup>1</sup> Antibiotics are the most frequently prescribed drugs among hospitalized patients especially in intensive care and surgical department. Programs designed to encourage appropriate antibiotic prescriptions in health institutions are an important element in quality of care, infection control and cost containment.<sup>2-5</sup> Principles of good prescribing are based on sound knowledge and understanding of the Pathophysiology of disease to be treated, and the knowledge<sup>6,7</sup> of risks and benefits of the medicine. Irrational prescribing is a habit, which is difficult to change. Various factors which contribute to irrational prescribing include; lack of unbiased source of information, uncertainty about diagnosis, limited experience, aggressive drugs promotion by pharmaceutical industry and patients demand etc.

Extravagant use of antibiotics without careful considerations of their appropriate indications leads more rapidly to the emergence of resistant strains.<sup>8</sup> The recent emergence of antibiotic resistance in bacterial pathogens both nosocomially and in the community is a very serious development that threatens antibiotic use.<sup>9</sup> The rampant spread of antibiotic resistance mandates a more responsible approach to antibiotic use, though it is often difficult to quantify the role of inappropriate antibiotic use in the emergence of antibiotic-resistant bacteria. However, the selection pressure of high levels of exposure to these drugs is probably the factor leading to bacterial mutations responsible for many mechanisms of resistance<sup>10</sup>. Rational prescribing can be achieved by practicing evidence-based medicine<sup>11, 12</sup>. Since pharmacist is often the final link between prescribed medication and the patient, better interaction between pharmacists and the patient can lead to better patient knowledge about drug use and compliance to therapy. The purpose of this study is to create awareness among the physicians about the efficient and rational prescribing

pattern systems of various medications especially antibiotics in order to make sure the usage of antibiotics in a rational way. The serious complications and unwanted reactions reported due to inappropriate prescribing of antibiotics, has been found to be increasing predominantly. Hence, these consequences made us to urge in carrying out the study.

#### **MATERIALS AND METHODS**

This is a prospective observational study was carried out for a period of 9 months in 110 hospitalized patients by scrutinizing the inpatients case sheets in KIMS Hospital, Secunderabad, Andrapradesh, India. Records of 110 patients (67 males and 43 females) aged between 20-89 years (mean:  $52.6 \pm 14.6$ ) were selected by simple random sampling technique. All the patients treated with Antibiotics for various infections, admitted in Intensive care unit of KIMS hospital, patients who were willing to participate, were included in the study.

Patients below the age of 18 years and patients who are not willing to participate in the study were excluded. Patients were divided into different groups according to their age and sex. Data for the present study was collected by scrutinizing inpatient case sheets. The data collected was analyzed for the prescribing patterns of antibiotics and demographic profile of the patients.

The patients enrolled in the study were grouped based on the number of Antibiotics prescribed.

**Group 1**-Monotherapy-Single Antibiotic was used,

**Group 2**-Dual therapy-Two Antibiotics were used,

**Group 3**-Triple therapy-Three Antibiotics were used and

**Group 4**- More than three Antibiotics were used.

Data are presented as mean  $\pm$  standard deviation, while categorical data are presented as percentages.

#### **RESULTS AND DISCUSSION**

The mean age of patients was  $52.3 \pm 14.6$  years. Of the 110 patients studied, maximum number were in males 67 (60.90%) than females 43 (39.09 %). Careful literature reveals that there is no correlation between gender and occurrence of infections. The most frequent infectious diseases are CNS Infections (46.36%), Urinary tract infections (31.81%), Respiratory Tract Infections (20%). The results revealed that majority of the patients were found with multiple co morbidities with infectious diseases, out of total population 67 patients were found with multiple co morbidities, in this, 31 patients were found with Diabetes mellitus + Hypertension followed by 12 patients with Diabetes mellitus + Seizure, 9 patients with Diabetes mellitus + Hypothyroidism and 8 patients with Diabetes mellitus + Hypertension + Hypothyroidism. Diabetes mellitus was found to be present in 21 patients out of 31 patients having single co morbidity and 10 patients with Hypertension. (Table 1)

Of the 110 patients studied, 6.3% (07) were on monotherapy and 92.7% (102) on combination therapy. Of the patients on combination therapy, 51.81% (58), 34.54% (38) and 6.3% (07) were on 2, 3 and more than three drugs, respectively. The results revealed that the maximum numbers of patients i.e. 58 were underwent dual therapy, 38 patients with triple therapy and 7 patients of each were underwent with More than three and Monotherapy respectively. In order to find out the prevalence of Infectious diseases the age range was divided as per the need. During the study, the maximum number of patients i.e. 37 (33.63 %) was found to be in the age group of 60-69 years.

The most frequently prescribed antibiotics as Monotherapy was Amikacin (57.14%) and Meropenem (42.85 %), likewise in dual antibiotic therapy Cilastin+Imipenem combination were used frequently (25.86%) and least used combination was Meropenem+Fluconazole (3.49%). In triple therapy Ceftriaxone + (Cilastin+Imipenem) combination were used in 17 (44.7%) patients, Fluconazole (Cefipime+Tazobactam) combinations were used only in 5 (13.17 %) patients. 4 (57.14%) patients were treated with 4 antibiotics which were found in two fixed dose combination followed by 3 (42.86 %) patients treated with 6 antibiotics which were found in Three fixed dose combinations, that combinations are (Piperacillin+Tazobactam)+(Cilastin+Imipenem) and Amoxicillin + Clavulanic acid) +(Salbactam + Cefipyraxone)+(Cilastin+Imipenem) (Table – 2).

The proportion of patients on combination therapy in the current report (51.81%) is consistent with the value which was found already by researcher, the high prescription rate of combination therapy may be due to the high prevalence of patients with severe and moderate infectious diseases, and the presence of co-morbid diseases, particularly diabetes mellitus. These findings are consistent with the recent trends advocating the use of combination therapy as a first line treatment for many infectious diseases. Our observational study revealed that patients on combination therapy had significantly higher reduction in symptoms for Infectious Diseases than those on monotherapy at the same time it may create lot of further complications esp. in geriatric population. In the current study we were unable to determine the actual drug adherence.

#### **CONCLUSION**

In conclusion, our results shown that the choices of antibiotics reasonably comply with the national and international guidelines on the management of Infectious diseases. The benefit of combination therapy over monotherapy as well as possible better efficacy of

antibiotics in the study population was demonstrated. The present study was restricted only for a period of 9 months so therefore the exact prescription pattern cannot be revealed, in order to do so the study should be carried out for a long period of time.

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Table No: 1. Demographic Data

S.No	Demographics	Parameters	No of Patients	%
1	Age	20-29	02	1.8
		30-39	09	8.2
		40-49	22	20
		50-59	31	28.2
		60-69	37	33.63
		70-79	06	5.45
		80-89	03	2.72
2	Most frequent ID	CNS	51	46.36
		RTI	35	31.81
		UTI	22	20.00
		Other	00	00
3	Co-morbidities with ID	<b>Single</b>	31	28.18
		Diabetes mellitus	21	67.74
		Hypertension	10	32.25
		<b>Multiple</b>	67	60.90
		Diabetes mellitus + Hypertension	31	46.26
		Diabetes mellitus + Seizure	12	17.91
		Diabetes mellitus +CKD	07	10.44
		Diabetes mellitus + Hypothyroidism	09	13.43
		Diabetesmellitus+Hypertension+Hypothyroidism	08	11.94
		<b>Without</b>	12	10.90

ID: Infectious diseases

Table No: 2. Prescribing Pattern of Antibiotics

S.No	Antibiotics treatment	No of patients	%
1	<b>Group – I Monotherapy</b>		
	Amikacin	04	57.14*
	Meropenem	03	42.86
2	<b>Group – II Dual therapy</b>		
	1.Cilastin+Imepenem	15	25.86 *
	2.Meropenem+Vancomycin	04	6.89
	3.Fluconazole+Colomycin	04	6.89
	4.Ofloxacin+Ornidazole	08	13.79
	5.Piperacillin+Tazobactum	07	12.06
	6.Colomycin+Imepenem	03	5.17
	7.Cefazolin+Amikacin	04	6.89
	8.Meropenem+Teicoplanin	03	5.17
	9.Cefipime+Tazobactum	08	13.79
	10.Meropenem+Fluconazole	02	3.49
3	<b>Group – III Triple therapy</b>		
	1.Ceftriaxone + (Cilastin+Imipenem)	17	44.7
	2.Amikacin(Piperacillin+Tazobactum)	13	34.21*
	3.Amikacin(Salbactum+Cefipyraxone)	03	7.89
	4.Fluconazole(Cefipime+Tazobactum)	05	13.17
4	<b>Group – IV More than three</b>		
	(Piperacillin+Tazobactum)+(Cilastin+Imipenem)	04	57.14*
	(Amoxicillin+Clavulanic acid) + (Salbactum+Cefipyraxone)+(Cilastin+Imipenem)	03	42.86

\*Most commonly used ABs

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