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DRUG USE EVALUATION OF ANTIBIOTICS IN NON TEACHING TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: The main objective is to investigate the irrationality of prescribing patterns of antibiotics in prescription. This helps in improvise rationality of antibiotics by enhancing quality of life and socio-economic status of patient. **Methodology:** It is a prospective observational study done at Asian Institute of Gastroenterology Hospital, Somajiguda, Hyderabad, Telangana. **Results:** A total of 170 patients consisting of 101 males (59.4%) and 69 females (40.54%) were enrolled. Among these majority of patients 45(26.47%) were in the age group of 41-50 years. 92(54.12%) patients were prescribed with antibiotics in General Medicine department. The most commonly prescribed antibiotics were Cephalosporin's and tetracyclines. Majority of drugs 66.32% with single drug was prescribed in General Medicine department followed by 23.68% in Neurology. Of the 170 patients analyzed in various departments, it was observed that hospital physicians prescribed antibiotics more rationally with no banned drugs and lesser newer drugs. **Conclusion:** This study states that development of clinical pharmacy services is also necessary to improve rational prescribing of antibiotics. Utilizing of clinical pharmacy services shows benefit of patient health related outcomes and also improves the economic status of patients.

KEYWORDS: Antibiotics, Prescribing pattern, Antibiotic resistance, Cephalosporin's, General Medicine, Neurology, Quality of Life.

INTRODUCTION

Infections are the major reason for the poor prognosis of a condition. So proper control of infections can avoid or prevent certain situations which lead to morbidity or mortality. Control of infections can be achieved by usage of antibiotics. Just like a coin have two sides; antibiotics also have two-sided effects. One is in control of infection; the other is the resistance of an organism. For a decade, the problem of resistance is rising. This led to the usage of fixed dose combinations, usage of multiple antibiotics in order to have a good control on infection.[1]

Today, antibiotics are one of the most expensive drug expenditure in hospitals accounting for 20% to 50% of total pharmacy spending with intravenous antibiotics accounting for the most expensive category of antibiotics in hospitalized patients. Furthermore, patients on intravenous therapy often had prolonged hospital stay to complete antibiotic treatment.

A switch from intravenous to oral therapy could favor an earlier discharge and directly save healthcare costs. Although the relationship between duration of intravenous antibiotic therapy and length of hospital stay was well recognized, the delayed switch produced additional costs per hospitalization. These results concur with findings in comparable studies, where saving were achieved with a timely transition from intravenous to oral therapy. Savings were achieved through reduced costs of oral antibiotics and due to a shortened period of hospitalization.[2]

Drug Utilization Evaluation (DUE) studies are designed to assess drug usage appropriateness**.** Drug utilization studies have the potential to make objective evaluation and analysis of health professionals work and provide them with feedback to stimulate thinking about their practice and looking for ways to improve their own performance. To improve the overall drug use, especially in developing countries, international agencies like the (WHO) World health organization and International network for the rational use of drugs (INRUD) have applied themselves to evolve standard drug use indicators. An audit of antibiotic prescribing patterns is an important indicator of the quality and standard of clinical practice.[3]

"The rational use of drugs requires that patient receives medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at lowest cost to them and their community".[4] Rational prescribing refers to

prescribing of right drug to the right patient, in the right dose, at right time intervals and for right duration.[5] Excessive and inappropriate use of antibiotics causes significant adverse effects such as increase of morbidity and mortality, drug toxicity, long hospitalization period, increase of costs, resistant microorganisms and associated infections.[6-10]

STEWARD PROGRAM

Several strategies to optimize use of antibiotics, often referred to as antibiotic steward programs, have been developed.[9] Antimicrobial stewardship has been defined as the limitation of inappropriate antimicrobial use while optimizing antimicrobial drug selection, dosing route and duration of therapy in order to maximize clinical cure and to limit unintended consequences, such as emergency of resistance, adverse drug events and the selection of pathogenic microorganisms.[11]

MATERIALS AND METHODS

The present research study was a prospective study design carried out in four In-patient departments (General Medicine, Neurology, Nephrology and Gastroenterology) of Asian Institute of Gastroenterology Hospital. The first step in the study is to design a documentation form. Documentation form will used to collect patient details to known about their past and previous medication histories, lab results and other details of the patient. The duration of study was six months. A total of 170 prescriptions were collected and analyzed. The patients who visited outpatient department, who were mentally retarded, pediatric patients, geriatric patients were excluded from this study.

RESULTS AND DISCUSSION

According to gender analysis Out of 170 patients, 101(59.46%) were male and 69(40.54%) were female. A demographic detail reveals that males are more prescribed with antibiotics when compared to females.

According to age group analysis, 10(5.88%) cases are in age group of 11-20, 25(14.71%) cases are in age group of 21-30, 30(17.66%) cases were in age group of 31-40, 45(26.47%) cases are in age group of 41-50, 40(23.53%) cases were in age group of 51-60 and 20(11.76%) cases are in age group of 61-70. This data reveals that antibiotics are most prescribed in patients ageing between 41-50 years followed by 51-60 age group data was shown in figure 1. A total of 170 patients were in various Departments details were summarized in Table. 1.

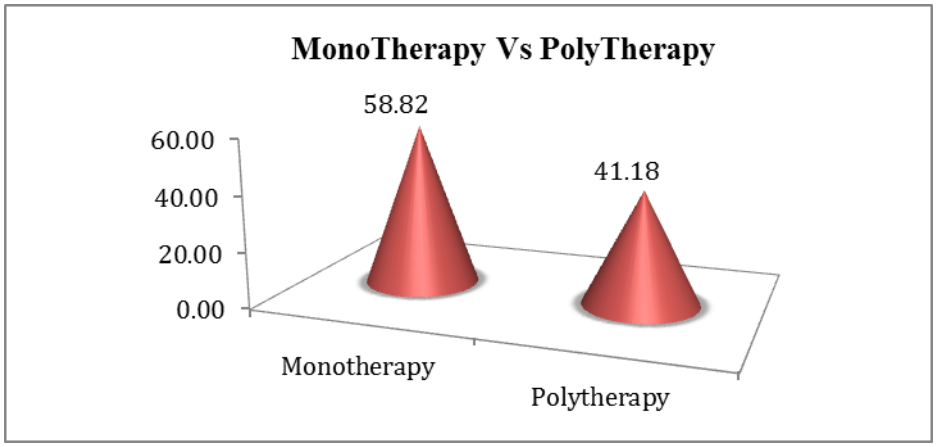

Figure 1: Age Distribution of Patients.

Table 1: Department wise Distribution of Patients.

Sr.No.	Name of The Department	No. of Patients	Percentage (%)
1	Neurology	47	27.65%
2	Gastroenterology	17	10.00%
3	Nephrology	14	8.24%
4	General Medicine	92	54.12%

ANTIBIOTICS USED IN VARIOUS DEPARTMENTS

Out of all departments at hospital, 47(28%) patients are prescribed with antibiotics in Neurology Department, 17(10.00%) patients are prescribed with antibiotics in Gastroenterology Department, 14(8.24%) patients are prescribed with antibiotics in Nephrology Department, and 92 (54.12%) patients are prescribed with antibiotics in General Medicine Department. This data reveals that antibiotics are more prescribed in General Medicine department when compared to other departments.(fig.2) A total of 250 antibiotics are used in 170 prescriptions, Cephalosporin's are prescribed in 106 patients followed by Tetracycline's are prescribed in 38 patients; Fluoroquinolones are prescribed in 23 patients. Cephalosporins are most commonly used antibiotic class when compared to other class of antibiotics. Ceftriaxone is most commonly prescribed antibiotic in 3rd generation Cephalosporin's and it is the major antibiotic prescribed by generic name. Cephalosporins are highly prescribed in General Medicine followed by Neurology and Gastroenterology departments. Fluoroquinolones are highly prescribed in Nephrology followed by Gastroenterology department data as presented in figure 3.

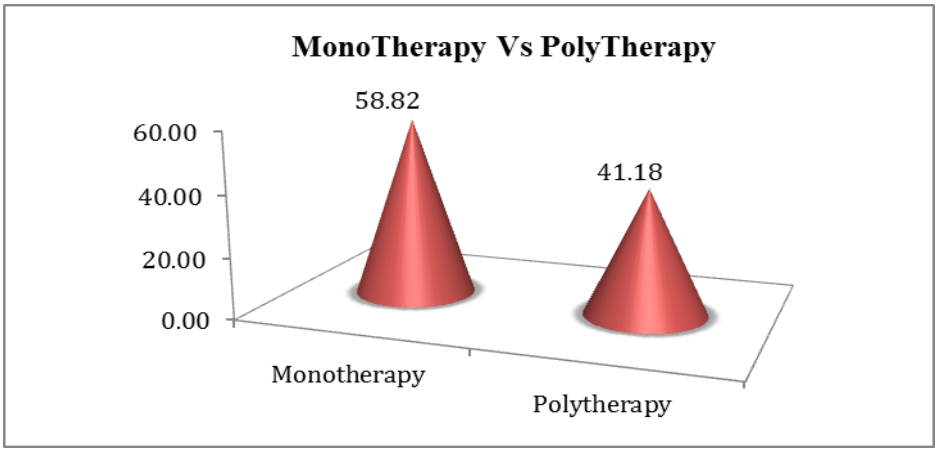

Figure 3: Commonly prescribed Antibiotics.

Generally, antibiotics are administered in Oral, Intravenous, and Intramuscular etc., of which we compared oral and intravenous. Intravenous are majorly used in Neurology and Gastroenterology departments, Oral administration was majorly used in General Medicine followed by Nephrology department. Both Intravenous and Oral route are majorly administered in General Medicine department. Out of 250 antibiotics, Oral Administration was 90 (36.0%) and IV administration was 160(64.0%). Data was presented in Data was represented in figure 4-5.

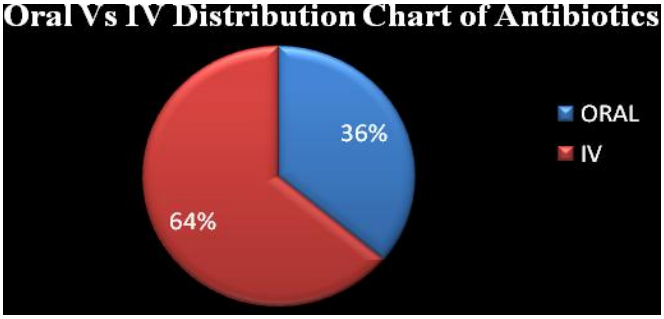

Figure 4: Oral v/s I.V Distribution Chart of Antibiotics.

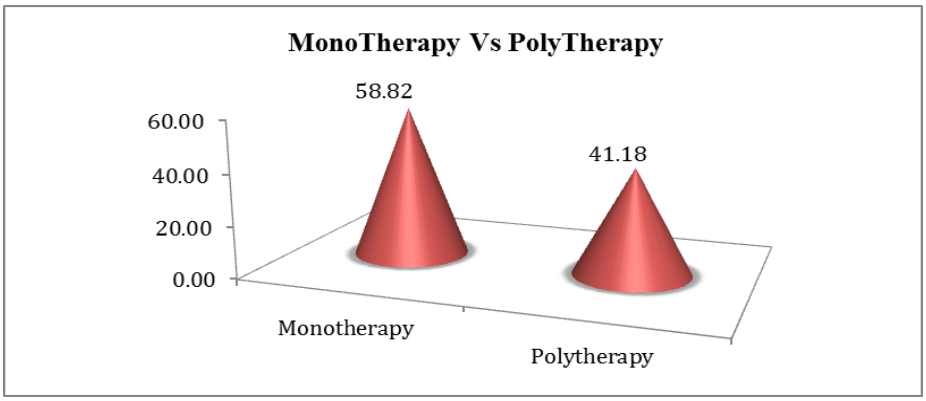

Figure 5: Oral Vs I.V Administration of Antibiotics in Various Departments.

Out of 170 prescriptions, 58.82% of prescriptions contain single antibiotic and 41.18% of prescriptions contain more than one antibiotic. Data was summarized in Table.2 and presented in Figure. 6. Single Therapy Vs Mono Therapy in various Departments was presented in Figure. 7.

Table 2: Details of Mono Therapy- Poly Therapy.

Sr. No.	Type of therapy	No. of Prescriptions	Percentage (%)
1	Monotherapy	100	58.82
2	Polytherapy	70	41.18

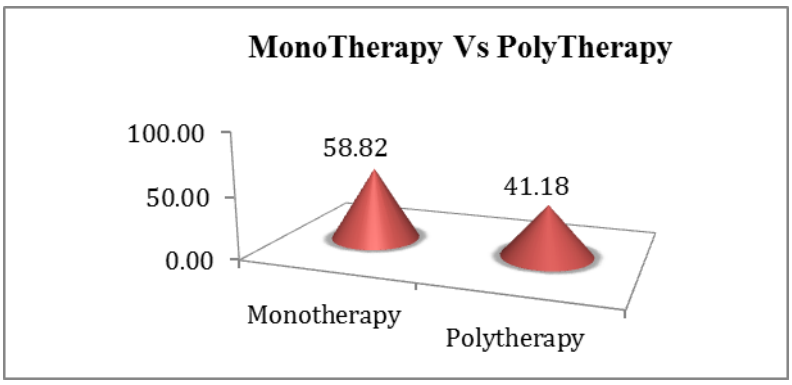

Figure 6: Mono therapy Vs Poly therapy.

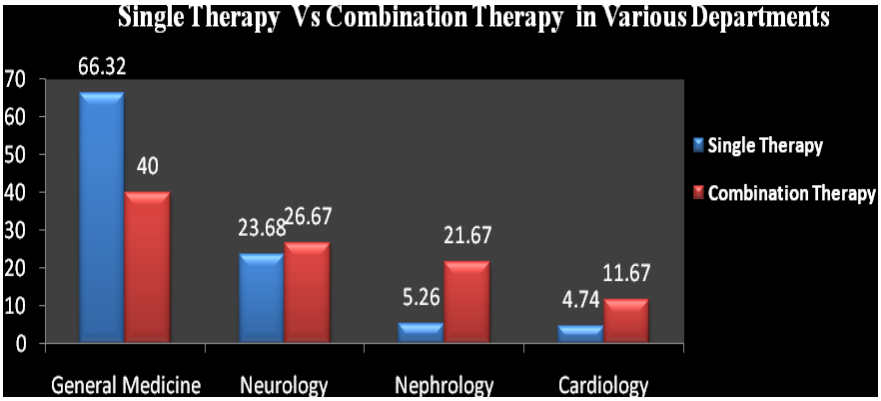

Figure 7: Single Therapy v/s Combination Therapy in Various Departments.

The antibiotic use pattern was assessed using WHO prescribing indicators the range of drugs per encounter was found to be 1-4. Results revealed 43.59% of drugs were not prescribed from essential drug list and 56.41% of drugs were prescribed from essential drug list. Data was listed in table 3.

Table 3: Assessment of Drug (Antibiotic) Use Evaluation Using WHO Prescribing Indicators.

Sr. No	Parameters	Percentage
1.	Average number of drugs per encounter	100
2.	Percentage of drugs prescribed by generic name	6.85
3.	Percentage of drugs with an antibiotic prescribed	100
4.	Percentage of drugs with an injection prescribed	64.5
5.	Percentage of drugs prescribed from essential dug list of formulary	56.41

CONCLUSION

In this project an attempt was made to study the antibiotics prescribing pattern in Asian Gastroenterology Hospital. This study was conducted for a period of six months. In this study, prescriptions were collected from Inpatients. When prescriptions of male patients were compared with female patients, it showed that male's prescriptions contained more antibiotics, than female patients. Majority of patients were treated with Cephalosporin's, Macrolides where the least prescribed antibiotics. This study states that development of clinical pharmacy services is also necessary to improve the rational prescribing of antibiotics. Utilizing of clinical pharmacy services shows benefit on patient health related outcomes and also improves the economic status of the patient.

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