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DRUG USE EVALUATION OF ANTIBIOTICS IN NON TEACHING TERTIARY CARE HOSPITAL

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Abstract

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. It is a prospective observational cohort study done at GBR Hospital, Narasaraopet, A.P. 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. 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.

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

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INTRODUCTION

Infections are a major breakthrough for poor prognostic conditions. Controlling of infection prevents morbidity or mortality rates accordingly. Thus, to overcome such manifestations, antibiotics can be a major outsource to regulate the health management. Just like a coin having two sides; antibiotics also have mutual & reciprocal effects. The former priority of antibiotics is to control the infection and the latter used to resist the organisms. For decades, the problem of resistance is increasing in double-fold. The authors are fascinated in outburst, for the regular usage of various antibiotic drugs which are emphasized in the current study. Nevertheless, the usage of fixed dose or usage of multiple antibiotic combinations helped to overcome the grossed interventions controlling the infection respectively [1]. Today, in market watch, antibiotics are driven hard as one of the most expensive drug formulary. In general, most of the accountings utilized in hospital for ailment cure to patients, about 20% - 50% of total pharmacy spending with I.V antibiotics are used, stabilizing the faster growth and custom category of antibiotics in hospitalized domain. In retrospective, patients on I.V therapy often had a prolonged hospital stay to outright antibiotic treatment.

A switchover from I.V to oral therapy could favor an earlier parole and directly salvage healthcare costs. Thus, duration of I.V antibiotic therapy prolonged the hospital stay and escalated the additional costs on the patient. These results accede with findings in comparable studies, where savings were achieved with a timely transition from I.V to oral therapy reducing the Costs of oral antibiotics and abridging the period of hospitalization[2]. Drug Utilization Evaluation (DUE) studies are designed to assess various modules of drug usage appropriateness**.** DUE studies have the potential to make objective evaluation and analysis of healthcare professional management. It also provides them with feedback, to stimulate thinking about their practice and looking forward to revitalize individual performance. To improve the overall drug usage in developing countries, international agencies like World Health Organization (WHO) & International Network for the Rational Use of Drugs (INRUD) have applied themselves to evolve standard drug modules. A scrutiny of antibiotic prescribing patterns is an important aspect of both quality and standards of clinical practice [3]. "To rationalize the usage of drugs, patient must receive appropriate medications depending upon the clinical needs, meeting the close need of hour, in terms of legitimate monitoring by the concerned physician, adequate period of time and low cost maintenance to stabilize the healthcare outcomes"[4]. Rational prescribing refers to; prescribing of right drug in the right dose, at right intervals of time and for right duration of time to the patient [5]. Superfluous and disproportionate use of antibiotics causes emblematic adverse effects such as upsurge of morbidity and mortality, drug toxicity, protracted hospitalization period, inflation of costs, resistant microorganisms and correlated infections [6-10].

CHAMBERLAIN PROGRAM

Several blueprints were used to optimize & develop the usage of antibiotics often referred to as "antibiotic steward programs" [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 an eventual arrangement carried out in four In-patient (IP) departments (General Medicine, Neurology, Nephrology and Cardiology) at GBR Hospital, Narasaraopet, A.P. The foremost step is to design a documentation pattern. It is used to collect patient details, by knowing their past and previous medication histories, lab results and other relevant details of the concerned healthcare system. The duration of study was carried out for six months with vigorous and meticulous layout. A total of 170 prescriptions were collected, scrutinized and analyzed. The patients who visited out-patient (OP) department such as, mentally retarded, pediatric patients and geriatric patients were excluded from this study.

RESULTS AND DISCUSSION

According to gender analysis, 170 patient's case studies were conscripted on an arbitrary groundwork. Of the total strength picked, 101 patients (59.46%) were male and 69 patients (40.54%) were female. A demographic detail concedes, males are more prescribed with antibiotics when compared to females. According to age group analysis, 10 cases (5.88%) are in age group of 11-20 years, 25 cases (14.71%) are in age group of 21-30 years, 30 cases (17.66%) were in age group of 31-40 years, 45 cases (26.47%) are in age group of 41-50 years, 40 cases (23.53%) were in age group of 51-60 years and 20 cases (11.76%) are in age group of 61-70 years respectively. This data affirms, most of the antibiotics are prescribed in patients ageing between 41-50 years followed by 51-60 aged groups. The details are projected in Figure: 1. A volume of 170 patients, organized in various departments are scheduled and summarized inTable: 1.

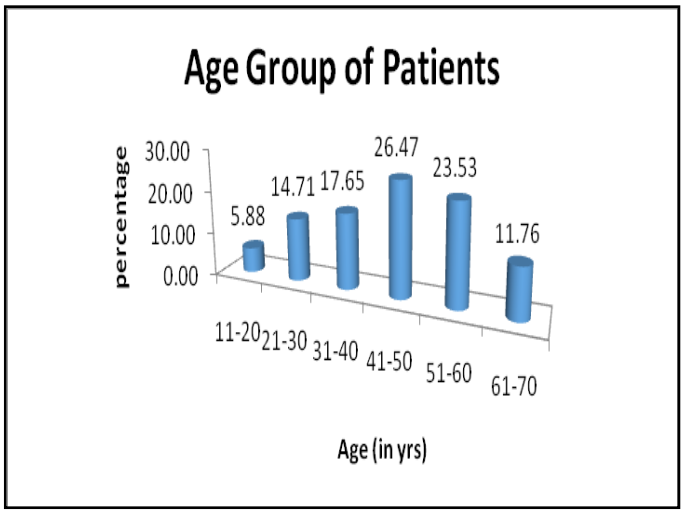


Figure 1: Age Distribution of Patients

Table 1: Department wise Distribution of Patients

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

ANTIBIOTICS USED IN VARIOUS STATIONS/DEPARTMENTS

Out of all the departments at the GBR hospital, Narasaraopet, A.P., 47(28%) patients are prescribed with antibiotics in Neurology department, 17(10.00%) patients are prescribed with antibiotics in Cardiology 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 exposed the usage & management of antibiotics which are highly recommended in General medicine department when compared to other departments as depicted in Figure: 2. In total volume of 250 antibiotics used, 170 prescriptions of Cephalosporin's are prescribed for 106 patients followed by Tetracycline's for 38 patients and Fluoroquinolones prescribed for 23 patients. Cephalosporins are frequently used antibiotic class when compared to other class of antibiotics. Ceftriaxone (Ceftrax Vial) 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 Cardiology departments where as Fluoroquinolones are highly prescribed in Nephrology station supervened by Cardiology department and the comparative data represented in Figure 3.

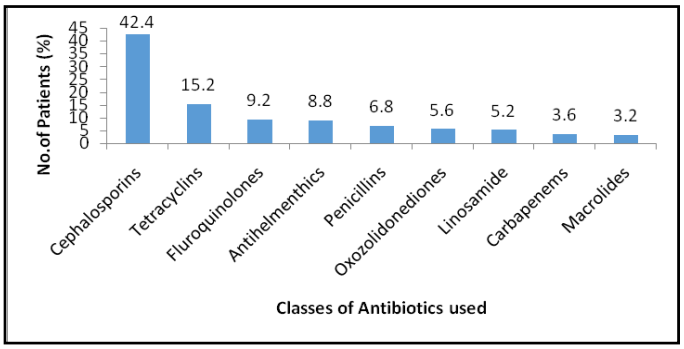


Figure 3: Commonly Prescribed Antibiotics

Generally, antibiotics are administered in Oral, I.V and I.M, of which the authors particularly investigated the comparative design on oral and I.V subsequently. Intravenous are majorly used in Neurology and Cardiology departments. Oral administration was majorly used in General medicine followed by Nephrology departments. Both I.V and Oral route are majorly administered in General medicine department. Out of 250 antibiotics assigned, oral administration was given to 90(36.0%) patients and I.V administration was given to 160(64.0%) patients for the investigational purpose. The data capitulated was represented in Figures 4 & 5.

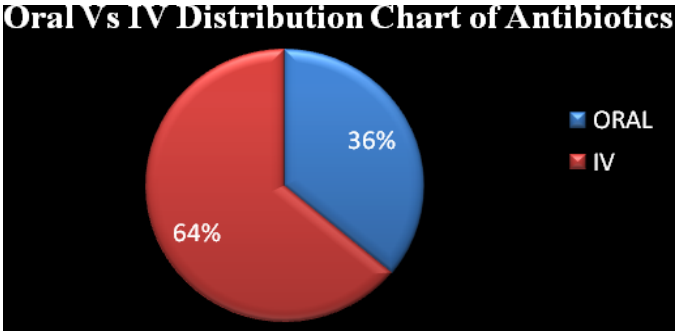


Figure 4: Oral v/s I.V Distribution chart of Antibiotics

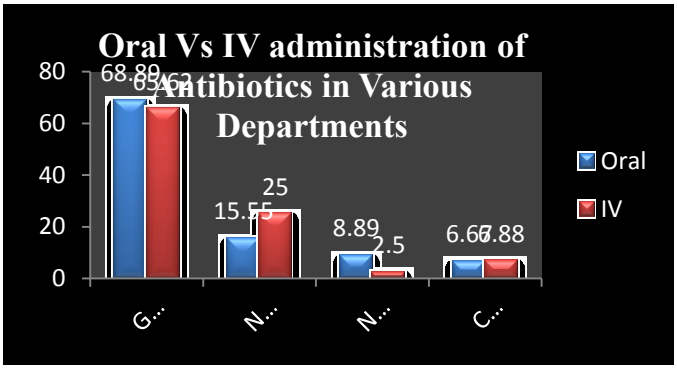
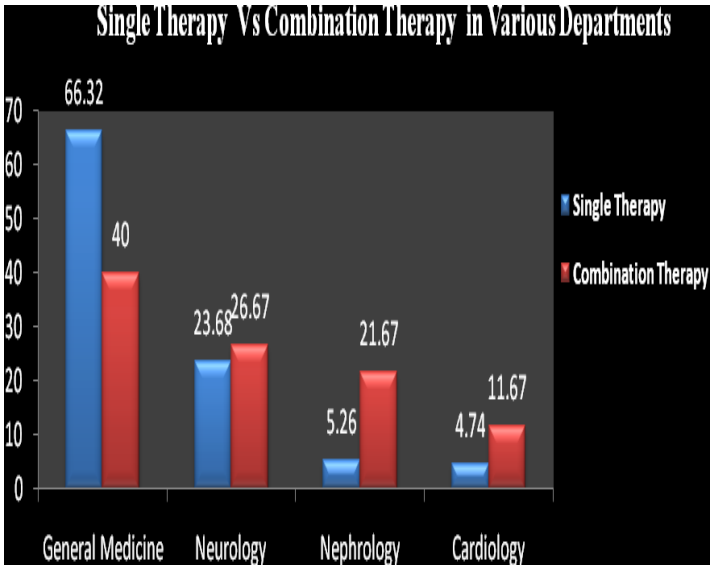


Figure 5: Oral Vs I.V Administration of Antibiotics in various Departments

Out of 170 prescriptions, 58.82% of prescriptions contain single antibiotic and 41.18% of prescriptions contain more than one antibiotic correspondingly. The data was summarized in Table: 2 and illustrated in Figure: 6 respectively. Single Therapy Vs Mono Therapy in various Departments was conferred in Figure: 7.

Table 2: Outlay for Mono & Poly Therapy

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



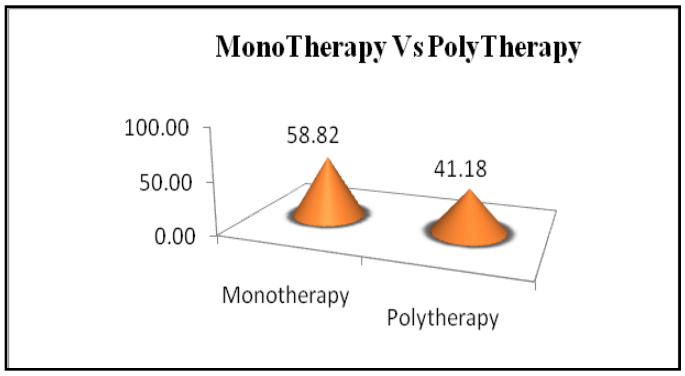


Figure 6: Mono therapy Vs Poly therapy

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

The antibiotic use pattern was assessed, by using the range of drugs per confrontations which were found to be 1-4, in accordance to WHO prescribing indicators. Results revealed 43.59% of drugs were not prescribed from essential drug index and 56.41% of drugs were prescribed from essential drug archives. The data was enlisted in Table: 3 accordingly.

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 antibiotic prescribing pattern in GBR Hospital, Narasaraopet, A.P. This study was conducted for a period of six months with robust effectiveness. In this study, the prescriptions were collected from IP ward. Prescriptions of male patients compared to female patients, showed that male's prescriptions contained more antibiotic usage, than female counterpart. Majority of patients were treated with Cephalosporin's, and Macrolides where the least prescribed antibiotics as projected in the pilot studies. 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 concerned patient.

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