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Prescription Pattern Analysis of Antibiotics Concerning General Medicine Department In A Tertiary Care Hospital: A Prospective Study

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ABSTRACT
Antibiotics are the most commonly prescribed drugs in hospitals. In developed countries, around 30% of the hospitalized patients are treated with antibiotics. Rational uses of drugs have attained more significance in present days in terms of medical, socio economical and legal aspects [1]. Pharmacists play a vital role in promoting the rational use of medicines. Medicines (drugs) cannot be used rationally unless all health care professionals involved in the pharmaceutical supply chain has access to know the complete information therapeutic indications of the drugs This study was carried out to collect patient's relevant demographic information which includes Age, Sex, Occupation, Date of admission, Date of discharge, History of present illness, past medical history, Diagnosis and prescription drugs [2]. 1) The aim of the research is to study and to determine the prescribing patterns of antibiotics and use of antibiotic (Rational / Irrational) in a tertiary care hospital along with its beneficial and adverse outcomes. 2) Intervene strategies from pharmacist perspective to promote rational use of antibiotics to improve therapeutic outcomes in patients thereby improving quality of life (QOL) of patients [3]. The study was carried at Shadan Institute of Medical Sciences, Shadan Hospital, Hyderabad. Antibiotics are prescribed based on symptoms and laboratory investigations. Antibiotics are indicated for the treatment of bacteriologically proven infections and non-bacteriologically proven infections. It is a single centered, prospective observational study. Subjects of both genders who indicated with antibiotic therapy are taken into consideration and patients who had co morbid pathological conditions also included. Pediatrics, pregnant women and surgical cases were excluded from the study [4].175 patients were collected; 75 were male and 100 were female. Total numbers of antibiotics prescribed are 260. Median duration of hospitalization was 5 days. The most common prescribed antibiotics were Ceftriaxone, Ciprofloxacin, Azithromycin, Amoxicillin+Clavulanic acid, Amikacin & Doxycycline. On assessing the results of study, it was found that prescribed 260 antibiotics accounted for 100%, ceftriaxone indicated was 35% followed by ciprofloxacin was 10 % and azithromycin was 6%. Irrational prescriptions becoming a serious problem in the General medicine department. For the achievement of Rational use of antibiotic to treat infections caused by microorganisms, selection the appropriate antibiotic partly depends on symptoms suffered by the patients. Awareness programs should be launched and seminars should be conducted so as to minimize problems which are common at ward level [5]. News Letters and Drug bulletins about the rational use of antibiotics should be released periodically. Cost effective prescription should be encouraged. Formulation of a policy for hospital antibiotic use and educational programs especially for junior doctors also required.

Keywords: Antibiotics, Drug utilization, General Medicine ward, Rational prescription, Quality of life, Cost effective prescription.

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INTRODUCTION

Antibiotics:

Antibiotics are a group of medicines used to treat infections caused by germs (bacteria and certain parasites). A parasite is a type of germ live in another living being (host). Antibiotics are available in the form of parental, oral, topical (creams, ointments, or lotions) to treat certain infections [6]. Certain antibiotics works by killing germs like bacteria or parasites by interfering with the structure of the cell wall of the bacterium or parasite, termed as *Bactericidal* and some other antibiotics inhibits the growth of germs, termed as *Bacteriostatic*. Most of the antibiotics are to be taken immediately after food while drugs used to reduce gastric acidity are to be taken on an empty stomach [7]. Antibiotics are usually grouped together based on their mechanism of action. The main categories of antibiotics include:

- *Penicillins*: Phenoxymethylpenicillin, Flucloxacillin, Amoxicillin.
- *Cephalosporins*: Cefaclor, Cefadroxil, Cefalexin, Cefuroxime
- *Tetracyclines*: Tetracycline, Doxycycline, Lymecycline.
- *Aminoglycosides*: Gentamicin, Tobramycin.
- *Macrolides*: Erythromycin, Azithromycin, Clarithromycin
- *Sulfamethoxazole and Trimethoprim*: co-Trimoxazole
- *Metronidazole and Tinidazole*
- *Fluoroquinolones*: Ciprofloxacin, Levofloxacin, Norfloxacin [8]

METHOD

Plan of work:

This study is performed to find the usage of antibiotics and to determine rational use of antibiotics of General Medicine ward admitted patients. All the prescriptions containing antibiotics will be monitored and documented to know the frequency and extent to which antibiotics are indicated.

Study site:

DEPARTMENT OF GENERAL MEDICINE, SHADAN INSTITUTE OF MEDICAL SCIENCES (SIMS), HYDERABAD.

Study design :

A hospital based prospective, observational study was carried with the inclusion of 175 patients in general ward. Demographical data of patient was documented which includes Age, Sex,

Occupation, Date of admission, Date of discharge, History of present illness, past medical history, Diagnosis and prescription drugs.

Sample size :

A total of 175 patients (in-patients as well out-patients) in department of General medicine of Shadan hospital prescribed with 260 antibiotics and the patients who fulfilled the inclusion and exclusion criteria are selected for the study.

Study criteria:

Inclusion Criteria:

- Both male and female patients who are prescribed with antibiotic therapy in general medicine department.
- Patients with co-morbid pathological conditions also included.

Exclusion criteria:

- Neonates and paediatric patients are excluded.
- Pregnant women are excluded.
- Patients admitted for surgical procedures also excluded.

Objectives:

- To determine the utilizations and percentages of different categories of antibiotics like Penicillins, Cephalosporins, Macrolides, Aminoglycosides, Tetracyclines & Fluoroquinolones.
- To determine the most frequently used antibiotic drug within the same category.
- To determine the utilizations and percentages of antibiotics prescribed to Male and Female patients.
- To determine the number and percentages of different types of infected cases.

RESULTS

Antibiotics utilisation and evaluation:

Penicillins utilisation overview

175 cases were collected and 260 antibiotics were prescribed which accounted for 100%. On assessment, Amoxicillin+Clavulanic acid (10 out of 260 antibiotics) was found to be highly prescribed antibiotic in penicillin's category. Amoxicillin+Clavulanic acid accounted for 4%, Ampicillin (8 out of 260 antibiotics) accounted for 3% and Piperacillin+Tazobactam (5 out of 260 antibiotics) accounted for 2%.

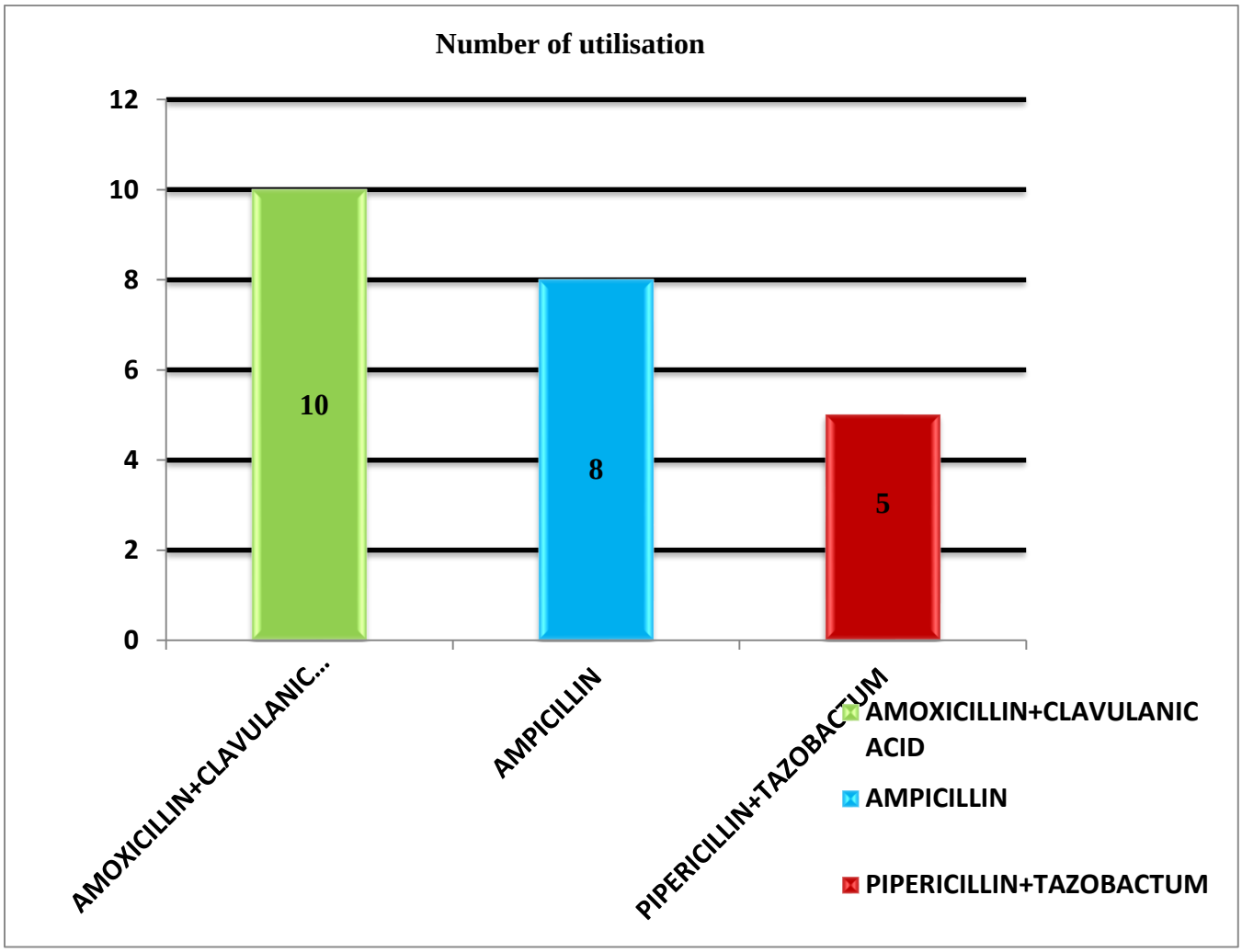

Figure 1: Penicillins Utilization Bar Graph

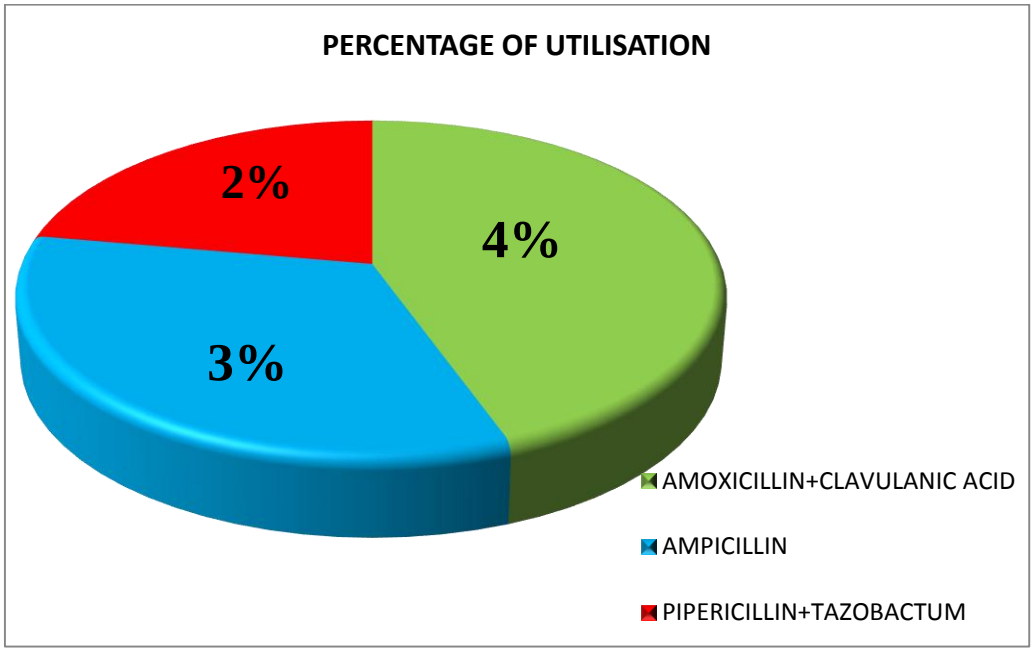

Figure 2: Penicillin percentage pie chart

Cephalosporins utilisation overview

175 cases were collected and 260 antibiotics were prescribed which accounted for 100%. On assessment, Ceftriaxone (92 out of 260 antibiotics) was found to be highly prescribed antibiotic in Cephalosporin's category. Ceftriaxone accounted for 35%, Cefixime (32 out of 260 antibiotics) accounted for 12%, Cefuroxime (14 out of 260 antibiotics) accounted for 5% and Cefoperazone+Sulbactum (9 out of 260 antibiotics) accounted for 3%.

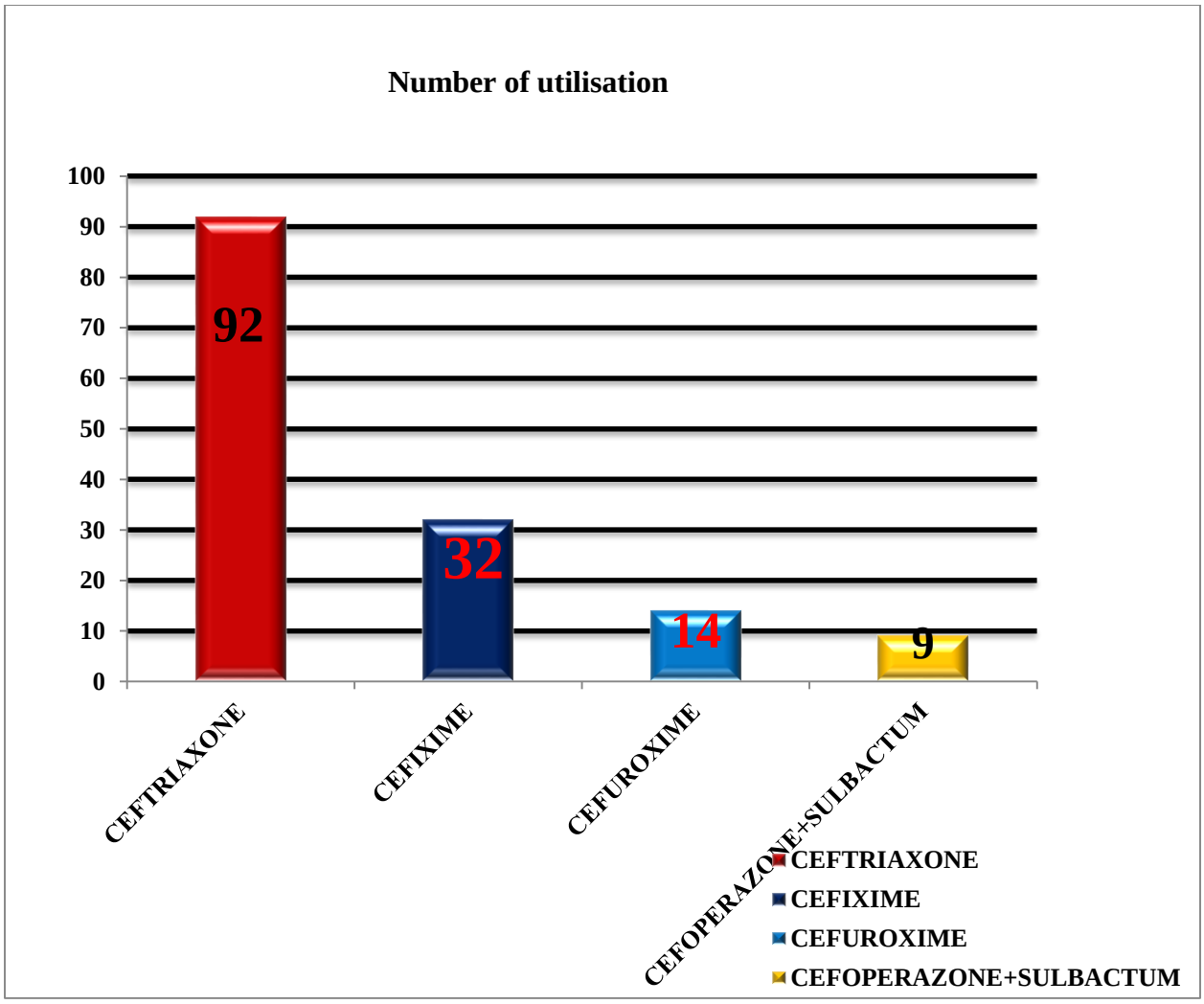

Figure 3: Cephalosporins Utilization Bar Graph

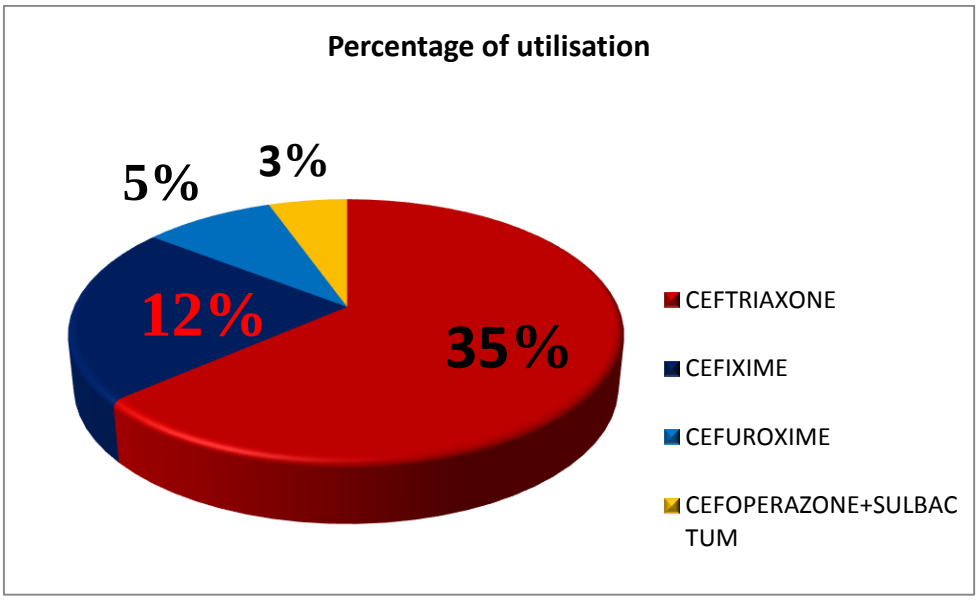

Figure 4: Cephalosporins Percentage Pie Chart

Macrolide Utilisation Overview

175 cases were collected and 260 antibiotics were prescribed which accounted for 100%. On assessment, Azithromycin (15 out of 260 antibiotics)was found to be highly prescribed antibiotic in Macrolide's category. Azithromycin accounted for 6%, Erythromycin (10 out of 260 antibiotics) accounted for 4% and Clarithromycin (8 out of 260 antibiotics) accounted for 3%.

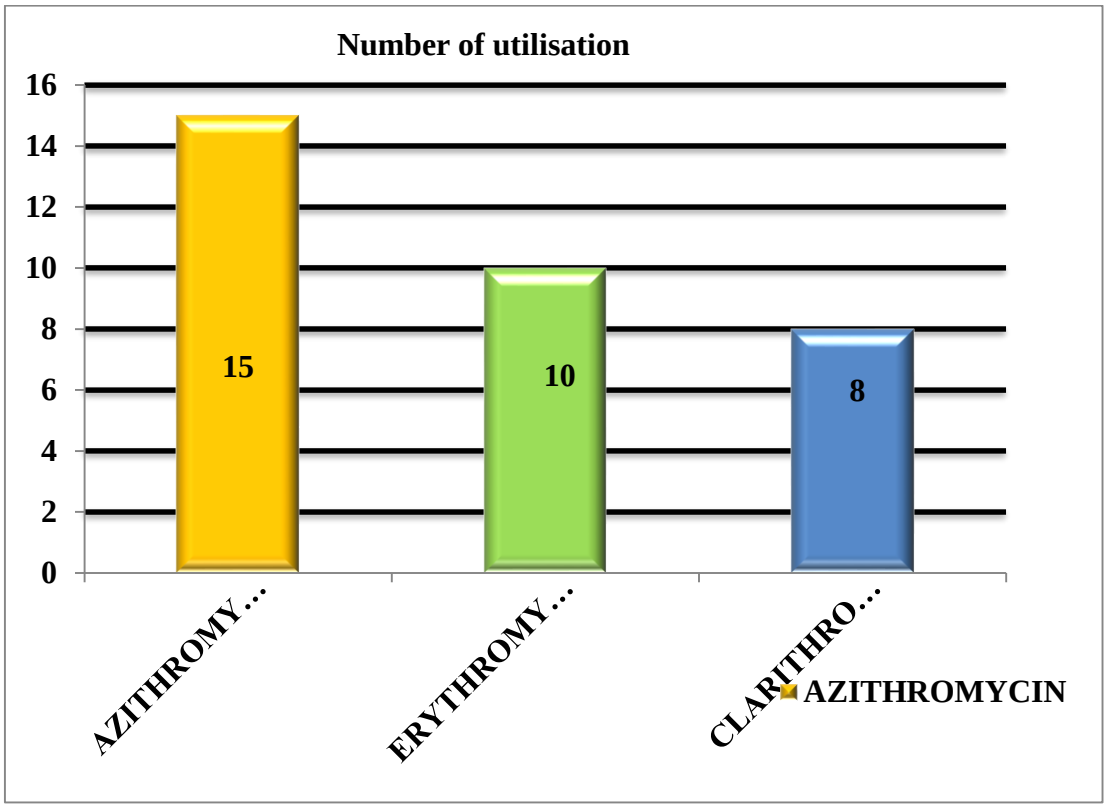

Figure 5: Macrolides Utilization Bar Graph

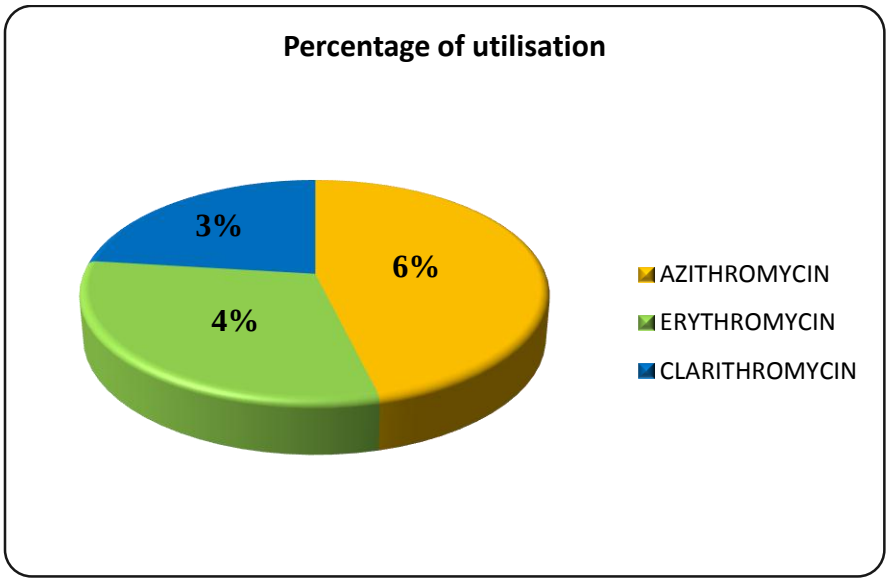

Figure 6: Macrolides Percentage Pie Chart

Aminoglycosides Utilization Overview

175 cases were collected and 260antibioticswere prescribed which accounted for 100%. On assessment, Amikacin (5 out of 260 antibiotics) was found to be highly prescribed antibiotic in Aminoglycosides category. Amikacin accounted for 2%, Gentamycin (2 out of 260 antibiotics) accounted for 1% and Streptomycin (2 out of 260 antibiotics) accounted for 1%.

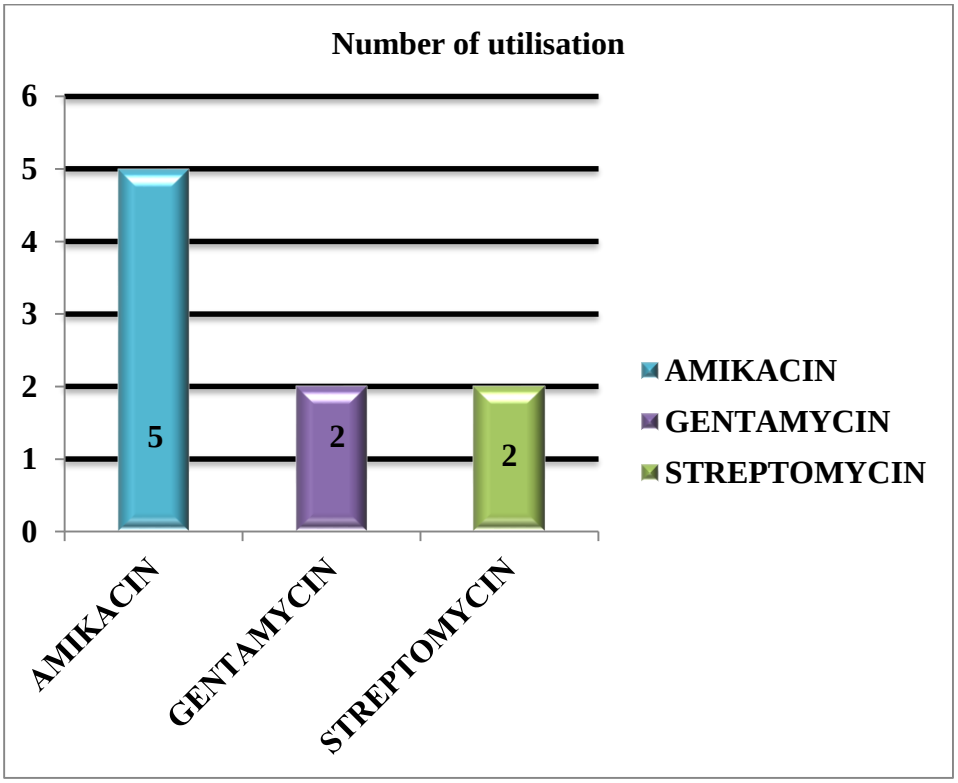

Figure 7: Aminoglycosides Utilization Bar Graph

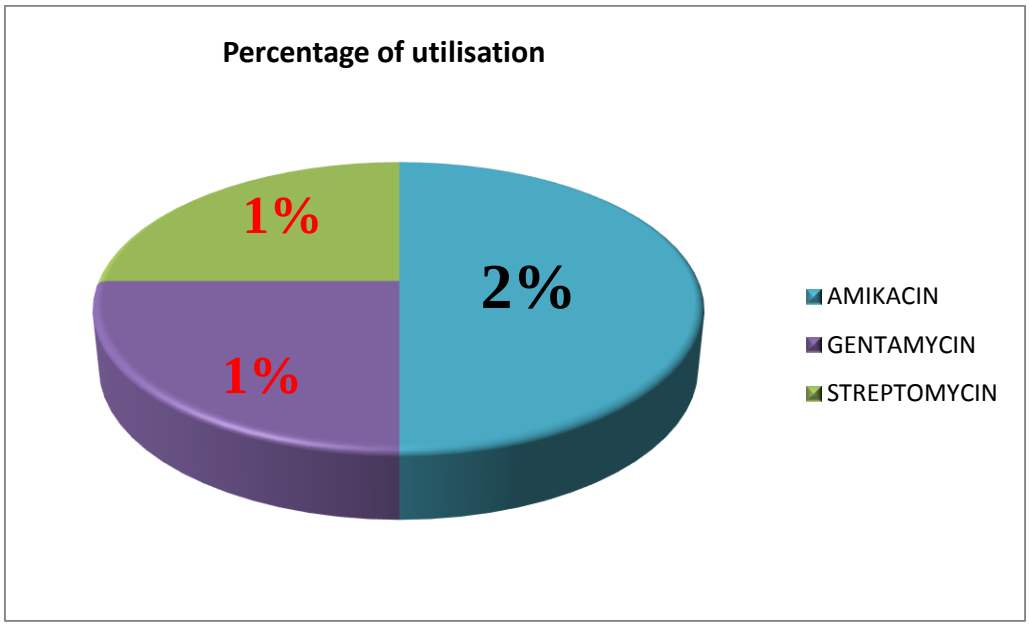

Figure 8: Aminoglycosides Percentage Pie Chart

Tetracyclines Utilization Overview

175 cases were collected and 260 antibiotics were prescribed which accounted for 100%. On assessment, Doxycycline (5 out of 260 antibiotics) was found to be highly prescribed antibiotic in Tetracycline's category. Doxycycline accounted for 2% while Tetracycline (2 out of 260 antibiotics) accounted for 1%.

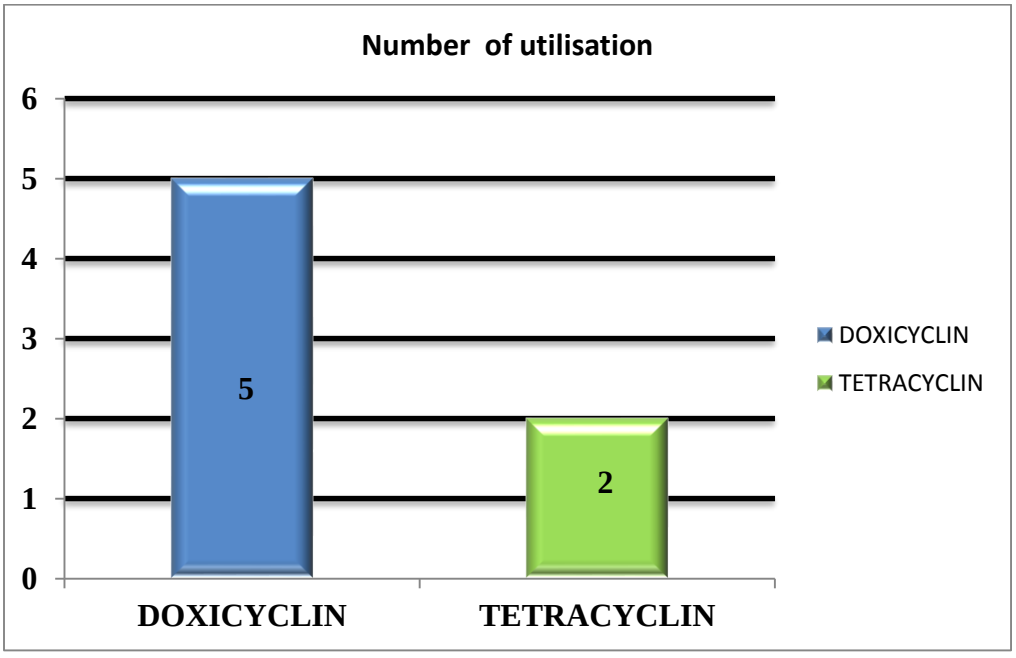

Figure 9: Tetracyclines Utilization Bar Graph

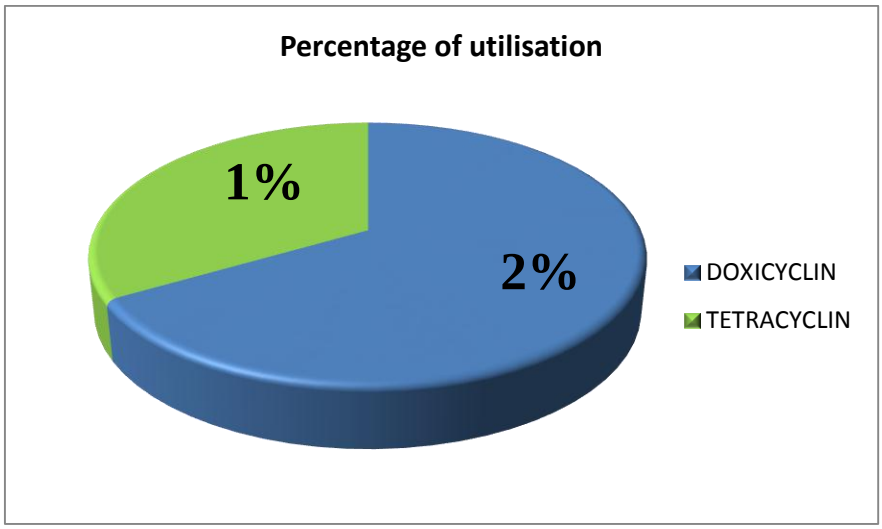

Figure 10: Tetracyclines Percentage Pie Chart

Fluoro Quinolones Utilisation Overview

175 cases were collected and 260antibioticswere prescribed which accounted for 100%. On assessment, Ciprofloxacin (26 out of 260 antibiotics) was found to be highly prescribed antibiotic in Fluoroquinolones category. Ciprofloxacin accounted for 10%, Levofloxacin (7 out of 260 antibiotics) accounted for 3%, Ofloxacin (5 out of 260 antibiotics) accounted for 2% and Norfloxacin (3 out of 260 antibiotics) accounted for 1%.

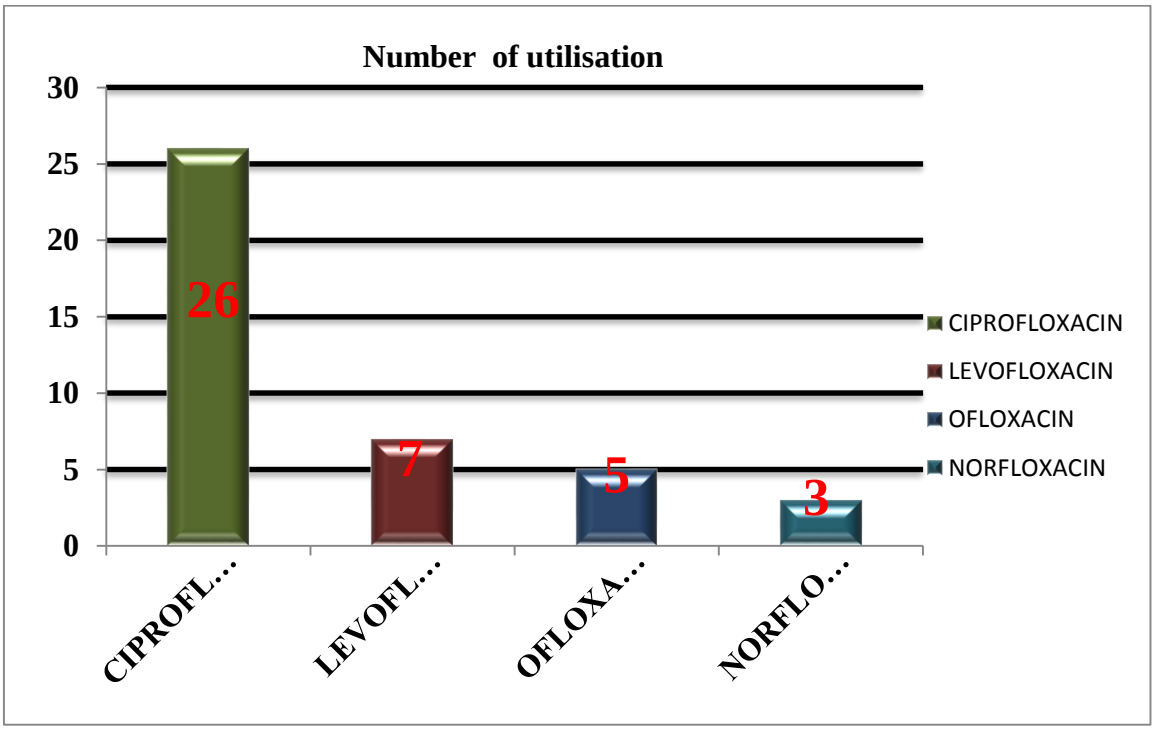

Figure 11: Fluoro Quinolones Utilization Bar Graph

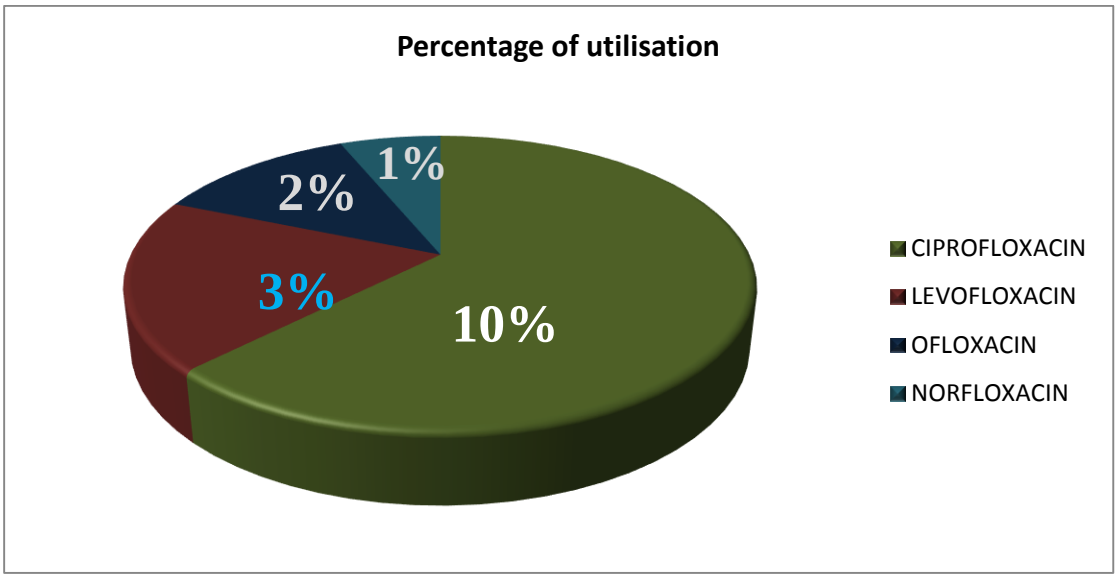

Figure 12: Fluoro Quinolones Percentage Pie Chart

Patient distribution based on Gender:

175 cases were collected and 260 antibiotics were prescribed which accounted for 100%. On assessment, it was found that male (75 cases) patients constituted for 43% whereas female (100 cases) patients constituted for 57%.

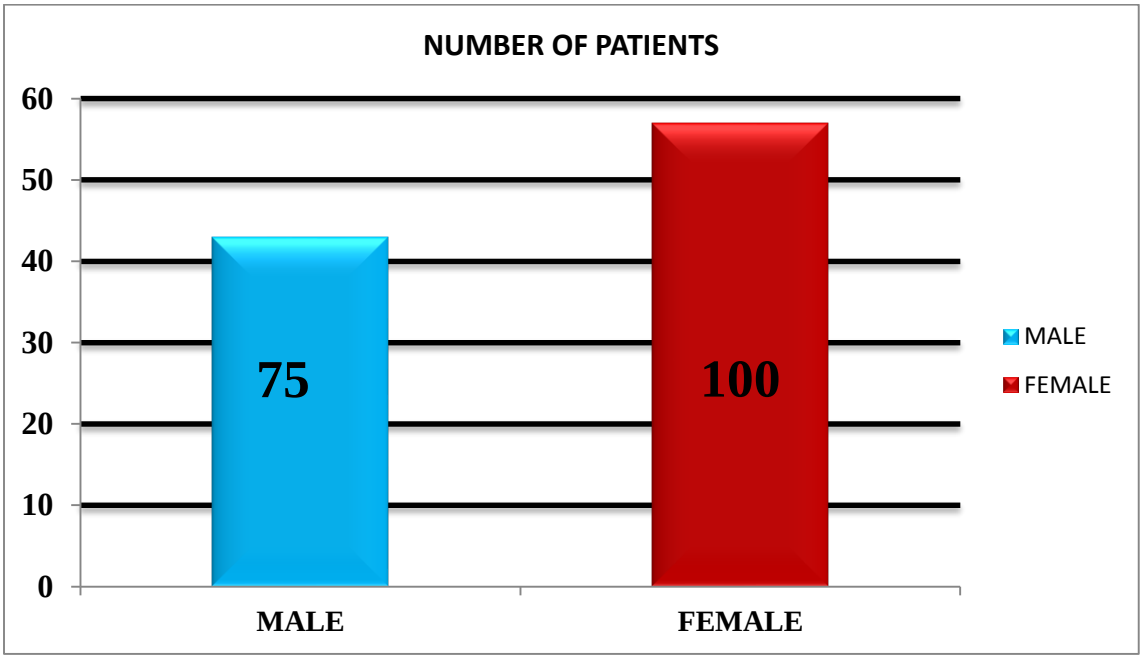

Figure 13: Patients Age Distribution Bar Graph

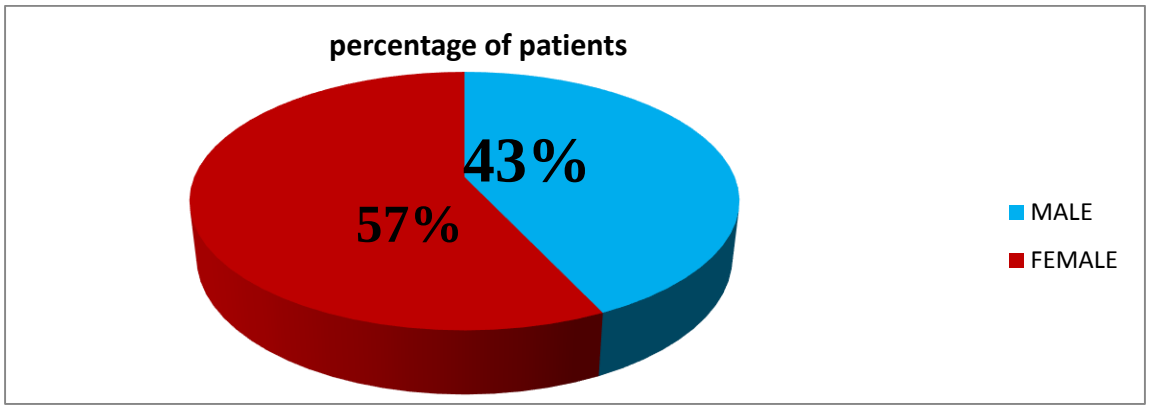

Figure 14: Patients Age Distribution Pie Chart

Antibiotics utilization in different infections.

Many physicians prescribe antibiotics on the basis of patient's chief complaints which indicate prophylactic treatment. On the basis of empirical therapy, majority of antibiotics were prescribed to treat respiratory tract infections (60 out of 175 cases) which accounted for 35%, urinary tract infections (48 out of 175 cases) accounted for 28%, gastrointestinal infections (15 out of 175 cases) accounted for 8%, cerebral infections (28 out of 175 cases) accounted for 16% and secondary infections (24 out of 175 cases) accounted for 13%.

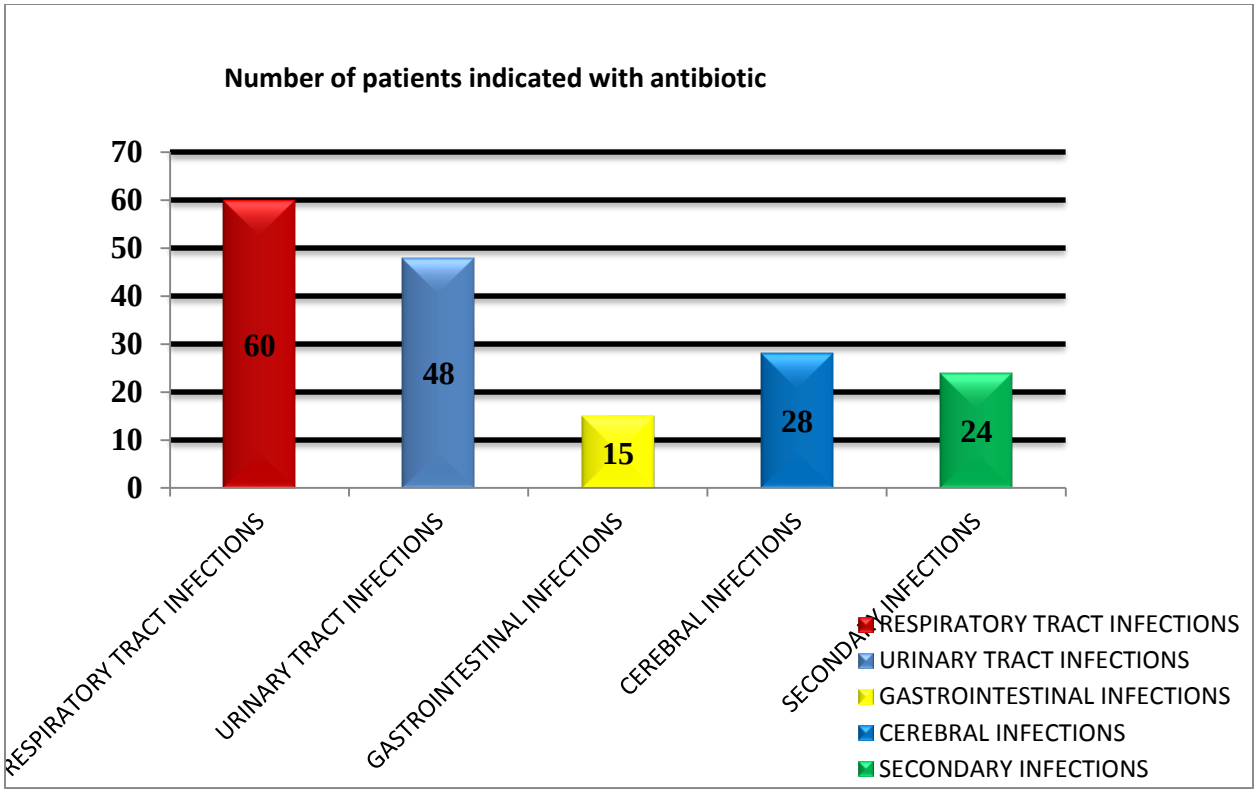

Figure 15: Antibiotics Utilization In Different Infections Bar Graph

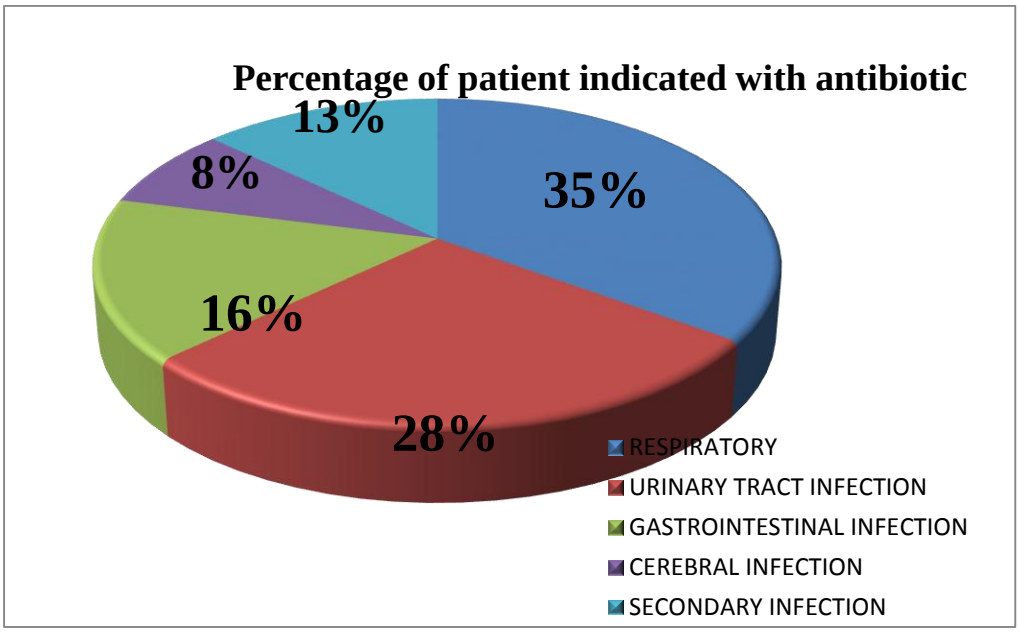

Figure 16: Antibiotics Utilization In Different Infections Pie Chart

DISCUSSION:

Antibiotics are the most commonly prescribed drugs in hospitals. In developed countries, around 30% of the hospitalized patients are treated with antibiotics. Excessive and inappropriate use of antibiotics contributes to the development of bacterial resistance [10]. Information about antibiotic use and resistance patterns of common microorganisms are lacking in hospitals. This study deals with the prescribing patterns of antibiotics in shadan institute of medical sciences (SIMS), Hyderabad. Physicians were prescribing broad spectrum antibiotics rather than narrow spectrum antibiotics, though several antibiotic guidelines recommends to use narrow spectrum antibiotics to treat infections. At the study site, physicians neither have standard antibiotic prescribing guidelines while prescribing, nor do they follow the available standard guidelines [11]. Ceftriaxone, Ciprofloxacin, Azithromycin and Amoxicillin were the most commonly prescribed antibiotics. Reduction of inappropriate use of antibiotics, especially broad-spectrum agents, is an important goal in acute care settings such as teaching hospitals. Quickening the availability of culture and sensitivity reports will also enables to provide effective treatment [12].

CONCLUSION

This study clearly highlights the practice (prescribing patterns) and rational use of different antibiotics concerning General medicine department in a Tertiary care hospital. Amoxicillin + Clavulanic acid found to be highly prescribed drug in Penicillins category, ceftriaxone found to be highly prescribed drug in Cephalosporins category, Azithromycin found to be highly prescribed drug in Macrolides category, Amikacin found to be highly prescribed drug in

Aminoglycosides category, Doxycycline found to be highly prescribed drug in Tetracyclines category and Ciprofloxacin found to be highly prescribed drug in Fluoroquinolones category. Cephalosporin category drugs constitute to be most prescribed drugs among six antibiotic categories[13,14]. In collaboration with other health care professionals, Pharmacists have a significant role in educating patients about hazards of self-medication, over use of drugs and poly-pharmacy [15]. Medical education of clinical pharmacology and pharmacotherapy should include the principles dealing with rational therapeutics. Hence, a teamwork involvement of Health care professionals in safe use of antibiotics and overall health care of the patient is very crucial. Future studies also necessary to decrease use of antibiotics in both out-patient and in-patient wards, also to maintain the sustainability in prescribing antibiotics according to WHO (World Health Organization) & FDA (Food and Drug Administration) guidelines [16].

REFERENCES

1. Srishyla MV, Naga Rani MA, Venkataraman BV: Drug utilization of antimicrobials in the in-patient setting of a tertiary hospital. Indian Journal of Pharmacology, 1994, volume 26, page no: 282-287.
2. Kuruvilla A, George K, Rajaratnam A, John KR: Prescription patterns and cost analysis of drugs in a base hospital in South India. National Medical Journal, India, 1994, volume 7, page no: 167-168.
3. Uppal R, Khanna S, Sharma SK, Sharma PL: Antimicrobial drug use in urology. International Journal of Clinical Pharmacology, Therapeutics & Toxicology, 1991, volume 9, page no: 366-368.
4. Sharma D, ReetaKh, Badyal DK, Garg SK, Bhargava VK: Antimicrobial prescribing pattern in an Indian tertiary hospital. Indian Journal of Physiology & Pharmacology, 1998, volume 42, page no: 533-537.
5. World Health Organization: WHO model list of essential drugs. WHO Drug Information, 1999, volume 13, page no: 249-262.
6. Van der Meer JW, Gyssens IC: Quality of antimicrobial drug prescription in hospital. Clinical Microbiological Infections, 2001, volume 7, page no: 12-15.
7. Shankar PR, Partha P, Shenoy N, Brahmadathan KN: Investigation of antimicrobial use pattern in the intensive care unit of a teaching hospital in western Nepal, American Journal of Infectious Control, 2005, volume 12, page no: 125-134.

8. Almasi I, Ternak G: Simple parameters of antibiotic utilization and diagnostic background of antimicrobial therapy in Hungarian hospitals, 1995, volume 13, page no: 473-478.
9. Das AK, Roy K, Kundu KK, Das N, Islam CN, Ram AK, Banerjee SN, Chaudhuri SB, Dutta S, Munshi S: Study of rational utilisation and cost analysis of antimicrobials in a
10. government teaching hospital, Indian Journal of Pharmacology, 2002, volume 34, page no: 59-61.
11. Stratton CW, Ratner H Johnston PE, Schaffner W: Focused microbiological surveillance by specific hospital unit: practical application and clinical utility. Clincal Therapeutics Journal, 1993, volume 15, page no: 12-20.
12. Zamin HT, Pitre MM, Conly JM: Development of an intravenous-to-oral route conversion program for antimicrobial therapy at a Canadian tertiary health care facility. Annals Pharmacotherapy, 1997, volume 31, page no: 564-570.
13. Mikic SS, Sabo A, Jakovljevic V, Fabri M, Stefan Z, Vukadinovic I, Dulejic V: Use of aminopenicillins in hospitals and outpatient facilities. Medical journal of therapeutics, 2001, volume 45, page no: 547-551.
14. Castro MS, Pilger D, Ferreira MB, Kopittke L: Trends in antimicrobial utilization in a university hospital, 1990–1996. Rev SaudePublica. 2002, volume 36, page no: 553-558.
15. Vlahovic-Palcevski V, Morovic M, Palcevski G: Antibiotic utilization at the university hospital after introducing an antibiotic policy. European Journal ofClincal Pharmacology, 2000, volume 56, page no: 97-101.
16. Blix HS: Utilization of antibiotics in and outside of health facilities in Norway, 2000, volume 12, page no: 1731-1734.