



**A PROSPECTIVE OBSERVATIONAL STUDY ON USE OF ANTIBIOTICS AND ITS  
OUTCOMES IN DEPARTMENT OF GENERAL MEDICINE IN A TERTIARY CARE  
HOSPITAL.**

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**ABSTRACT**

**Introduction:** Balanced utilization of medications might be characterized as: Patients get medicines according to their clinical needs, in order to meet their own particular individual necessities, for a satisfactory time frame, and the most minimal expense to them and their group this is likewise demonstrative towards utilization of antibiotics.

**Methodology:** The study was done in branch of general medicine in tertiary level hospital (Osmania general hospital). Which is 1400 bedded. The hospital is one of government prestigious institutes, overseen by senior experts, profoundly experienced in particular speciality. **Results:** the results were evaluated as per the methodology in four parts. On assessing the results of study it was found that out of 500 cases studied which accounted for 100%, (piperacillin+tazobactam) was found to be indicated the most in penicillins category almost 12% of cases were indicated with following combination antibiotic followed by (amoxicillin+clavulanic acid) in 11.6% of patients. ampicillin was prescribed at a rate of 10%, meropenam in 1.6% and lastly benzyl-penicillin in 0.4% cases.

**Conclusion:** A wide range of clinical dosing and assortment of medications were used from different medication classes. Results demonstrate that cephalosporins were broadly utilized, among cephalosporins ceftriaxone was for the most part recommended. After azithromycin and afterward piperacillin+tazobactam mix was endorsed on third place.

**KEYWORDS:** antibiotics, rational, irrational, utilization.

**INTRODUCTION**

Balanced utilization of medications might be characterized as: Patients get medicines according to their clinical needs, in order to meet their own particular individual necessities, for a satisfactory time frame, and the most minimal expense to them and their group this is likewise demonstrative towards utilization of antibiotics.<sup>[1]</sup> An anti-biotic that hinders bacterial development or eliminates microscopic organisms. It's a substance created by a miniaturized scale creature or artificially that is adversarial to the development of different microscopic organisms in high weakening. The unseemly antibacterial treatment and the abuse of antibiotics have added to the development of against bacterial-safe. Anti-biotic resistance is characterized as

the resistance of microorganisms to hostile to microbes and that happens when microscopic organisms changes to shield itself from antibiotics.<sup>[2]</sup> The development of antimicrobial resistance (AMR) is a note worthy worry in general well being and antibiotic use is by and large perpetually perceived as the fundamental unfair weight driving this resistance. Antimicrobial resistance is a more extensive term, incorporating imperviousness to medications to treat contaminations created by different microscopic organisms, As an after effect of resistance diseases neglect to react to standard treatment, so as result delayed sickness and expansion of danger to hostile to microbial resistance lead to decline impact of viable antibiotic and disease stays for delayed time frame and spread to other. At the point when microorganisms get to

be imperviousness to first line anti-microbial more costly anti-biotic agents are endorsed which expand expense of the treatment and expansion hospital stay.<sup>[3]</sup> This issue can't be anticipated however its predominance can be diminished Unreasonable utilization of solutions is a worldwide issue. Unreasonable utilization of anti-biotic agents is harmful for both patient and society. The unreasonable anti-biotic agents are one of the main ten reason for mortality and bleakness around the world.<sup>[4]</sup> Balanced utilization of a medication means when the patients get the medication which is proper, in order to meet their individual prerequisite, for a satisfactory timeframe at the most reduced cost both to them and the group and irrational utilization of Drug is that when one or a greater amount of the above condition is not met. It has been assessed that about portion of all drugs are endorsed, administered or sold improperly and that not as much as half of all patients take there meds as recommended or apportioned. irrational utilization of medicines can harm patients regarding poor patient result un-essential unfriendly responses and wastage of assets, regularly leads to out of pocket expenses by patient. Irrational utilization of antibiotic is especially genuine in light of the fact that it is adding to antimicrobial resistance that is expanding fast worldwide and it is bringing on noteworthy bleakness and mortality.<sup>[8]</sup> An abnormal state of anti-biotic resistance has significant outcomes for society, and particularly for those on the edges who have minimal access to human services. Postponing treatment with the right anti-biotic builds the possibility of seriousness and confusions and powers the utilization of more intense and costlier anti-biotic agents. Maybe straight forward contaminations ought to be treated with antibiotic that need hospitalization and that builds the weight on the overburdened hospital framework. It is in this manner critical to take a gander at what could advance the ascent of antibiotic resistance. One of the conceivable reasons for this marvel is the improper utilization of anti-microbials. Group contemplates have shown that for diseases, for example, loose bowels and fever, which are prevalently popular in etiology, roughly 70 percent of patients going to wellbeing offices are given antibiotic. This is an improper utilization of antibiotic (since anti-biotic agents have little impact on biotics) and has brought about expanded resistance.<sup>[11]</sup>

#### ***Development of Resistance***

Streptococcus pneumonia imperviousness to beta lactam anti-biotic includes adjustments of one or a greater amount of the penicillin restricting proteins, consequence of which lessening official of anti-biotic agents to restricting site. Enzymatic inactivation. The beta lactamase creating microbes inactivate the beta lactam antibiotic these chemicals hydrolysis the beta lactam ring aftereffect of which loss of it movement. It is essential for antibiotic to diffuse inside to microorganism and play out its role. In resistance living being such is microbes the anti-biotic agents is not concentrated inside microorganisms and does not create it activity. In

quinalones the DNA gyrase catalysts is changed and come about quinalones is not join to such particular protein in charge of it instrument of activity so does not demonstrate it impact. In amino glycoside the plasmid interceded acetyl Transferase in activate the amino glycoside and which result loss of its impact. reason for this irrational use it leded towards improvement of strains of microorganisms like super-bugs and mdr-tb for which the treatment have gotten to be unpredictable an uneasy.<sup>[19]</sup> M. Naqvi Syed et al (2015), examined the solutions of patients conceded in intensive care unit were investigated for the essential biotic and the anti-biotic agents classes were recorded. The expense of anti-biotic agents in remedies was computed from the drug store bills of the patients. In our study we found a sum of 177 anti- microbial that were endorsed for 110 patients contemplated, with a normal of  $(1.60 \pm 0.77)$  anti-toxins/medicine. The normal expense of the anti-biotic agents was INR  $(269.41 \pm 444.32)$  per remedy. Cephalosporin s were the most normally endorsed anti-microbial. So we could reason that the exact treatment with antibiotic is regular in intense units and along these lines the antibiotic ought to be reasonably endorsed to anticipate development of resistance and to minimize the cost trouble on the patient. K.Holloway et al Proof demonstrates that there is intense antibiotic abuse, for instance. Genuine abuse of anti-biotic agents in viral upper respiratory tract disease yet underuse of according anti-biotic agents for pneumonia; and genuine abuse of anti-microbials in intense instances of loose bowels yet underuse of oral rehydration arrangement. The couple of intercessions led and satisfactorily assessed in the Area demonstrate that focused on multi-part mediations including instructive and administrative intercessions are successful and can enhance anti-microbial use by 20%-30%. While Akinyandenu et al completed a review concentrated on irrational utilization of anti-biotic agents in which he audited distinctive distributed papers and diaries on irrationality an arrived at a conclusion that irrational utilize and non-medicine offer of anti-biotic agents won't just advance antimicrobial resistance, yet can likewise be connected with professed unfriendly occasions including drug antagonistic impacts, high cost and complications. In spite of the fact that the act of non-solution offer of anti-microbials is unseemly and dishonest, putting a prohibition on over the counter accessibility of anti-biotic agents could be shocking. For a few people, there is no option. Confinement of a few classes of anti-microbials is plausibility. As honed in the UK, where numerous remedy just medications (POM's) have been renamed to drug store just and general deals list status, the Nigerian government can imitate this change. Be that as it may, considering the Nigerian setting, there could be spillages. Changing the act of non-remedy deal and unreasonable utilization of anti-biotic agents requires a managed rebuilding of the Nigerian Wellbeing Framework in an offer to make restorative level accessible to individuals and advance training of the populace on anti-biotic use, and the levelheaded utilization of medications. Metcalfe et al (2013) The

survey included 24 concentrates on; 22 included patients with symptomatic contamination and two included solid volunteers; 19 were observational studies (of which two were planned) and five were randomized trials. In five investigations of urinary tract microscopic organisms (14 348 members), the pooled chances proportion (OR) for resistance was 2.5 (95% certainty interim 2.1 to 2.9) inside 2 months of anti-biotic treatment and 1.33 (1.2 to 1.5) inside 12 months. In seven investigations of respiratory tract microscopic organisms (2605 members), pooled ORs were 2.4 (1.4 to 3.9) and 2.4 (1.3 to 4.5) for the same time frames, individually. Thinks about reporting the amount of antibiotic recommended found that more drawn out term and various courses were connected with higher rates of resistance. Contemplates contrasting the potential for various antibiotic with incite resistance demonstrated no reliable impacts. Stand out imminent study reported changes in resistance over a long stretch; pooled ORs tumbled from 12.2 (6.8 to 22.1) at 1 week to 6.1 (2.8 to 13.4) at 1 month, 3.6 (2.2 to 6.0) at 2 months, and 2.2 (1.3 to 3.6) at 6 months. abid ullah \*et`al (2008) The Information was gathered on irregular premise containing 20(76.92%) male and 06(23.07%) female patients. Generally i.e. 23.07% the patients were in the scope of 10-20 years and 11.53% in the age scope of 41-50 years. In the majority of the cases reported the unreasonable utilization of anti-biotic agents. For the fruitful pharmacotherapeutic arrangements and discerning utilization of anti-biotic agents legitimate information about the medications is required keeping in mind the end goal to dispense with or to diminish the odds of medication collaborations in the recommended medications to the indoor patients. It will be in the better enthusiasm of the patients to give appropriate information to the Wellbeing experts and the patients with respect to the medications, to actuate clinical drug specialists at the wards level to guarantee the objective utilization of medications

#### **Aims And Objectives**

1. The point of the work is to study to decide the utilization of anti-microbial (rational/irrational) use in a tertiary level care hospital and its valuable and indifferent results.
2. The target of the study is to archive and examine the level headed utilization of anti-biotic agents.
3. To identify the spread of hostile to microbial resistance among the chose group of subjects.
4. In request to assess the security, and adequacy of treatment executed on subjects demonstrated with anti-biotic agents for treatment of disease.
5. To mediate techniques from drug specialist view point to advance the utilization of anti microbials keeping in mind the end goal to enhance helpful results in patients. With a specific end goal to enhance personal satisfaction of patient.

#### **METHODOLOGY**

The study was led in branch of general medicine in tertiary level hospital(Osmania general hospital). Which

is 1400 bedded hospital. The hospital is one of state government facility, oversaw by senior experts, profoundly experienced in particular field. The hospital works all surgical cases particularly cardiology, neurology and cemergency medication.

A pilot study was completed for a time of six months to discover the utilization of anti-microbial and commonness of anti-biotic resistance in populace. Every one of the medicines containing anti-biotic agents were observed and archived to know the recurrence and degree to which antibiotics were demonstrated. The study convention was planned on premise of need of study and was disclosed to the institutional ethics board of trustees an permission was obtained to complete the study according to the composed protocol. Writing which upheld the study was investigated for the requirement for discerning utilization of anti-biotic agents and normal writing regimens. A standard information passage structure was intended to archive patient`s profile and amid the ward rounds whole patient information were gathered with exceptional reference to those cases in which anti-biotic agents were shown and the entire information was recorded in the organization.

#### **Study Design**

This study was a hospital based forthcoming, observational study was completed on 500 patients. demographic information of patient was reported which included (age, sex, occupation date of confirmation, date of release, history of present sickness , past restorative history, family history, determination , treatment showed which recorded all drugs which were given to the subject. Alongside it information relating to culture test and its affectability was likewise taken into concern.

#### **Sample Size**

A total of 500 patients (in-patients as well out-patients) in department of general medicine of Osmania general hospital, who were prescribed with antibiotics and one`s who fulfilled the inclusion and exclusion criteria were selected for the study.

#### **Study Period**

The study was carried out for a period of six months from December 2015 to July 2016.

#### **Inclusion Criteria**

- Subjects of either sexes who were indicated with antibiotic therapy in general medicine department.
- Including patients with co morbid pathological conditions.

#### **Exclusion Criteria**

- Neonates and pediatrics were excluded.
- Pregnant women.
- An patients admitted for surgical procedures.

#### **Ethical Approval**

Authorization for gathering the patients information was

affirmed by intuitional ethics committee.

**RESULTS**

The result was evaluated as per the methodology in four parts.

- antibiotics utilization evaluation
- rationality of prescribed antibiotics
- antimicrobial resistance

On assessing the results of study it was found that out of 500 cases studied which accounted for 100%, (piperacillin+tazobactam) was found to be indicated the most in penincillins category almost 12% of cases were indicated with following combination antibiotic followed by (amoxicillin+clavulanic acid) in 11.6% of patients. Ampicillin was prescribed at an rate of 10%, meropenam in 1.6% and lastly benzyl-penicillin in 0.4% cases.

Ceftriaxone was found to be the most frequently prescribed drug with an rate of 50% in majority of cases it was prescribed in prophylaxis. cefixime was given to 2% an cefpodoxime in 0.8% cases.

**Table 1: Macrolide Utilisation.**

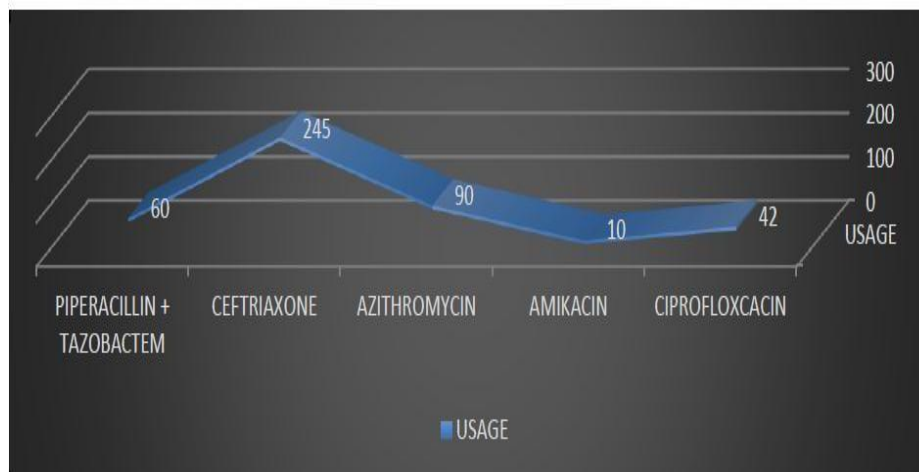
ANTIBIOTIC	PERCENTAGE OF UTILISATION
1)AZITHROMYCIN	18%
2)ERYTHROMYCIN	3%

Among macrolide`s category erythromycin, azithromycin were found to be used of

**Table 2: Aminoglycosides Utilisation.**

ANTIBIOTIC	PERCENTAGE OF UTILISATION
1)AMIKACIN	2%
2)GENTAMICIN	0.4%

Amikacin was more prominently used among aminoglycosides with an percentage of 2% followed by gentamicin in 0.4% of cases.



**Figure 2: Overall Usage of Antibiotics.**

**Table 5: Gender Based Distrubution of Subjects.**

GENDER	NO`S OF PATIENTS OUT	PERCENTAGE OF PATIENTS
1)MALE	376	75.2%
2)FEMALE	124	24.8%

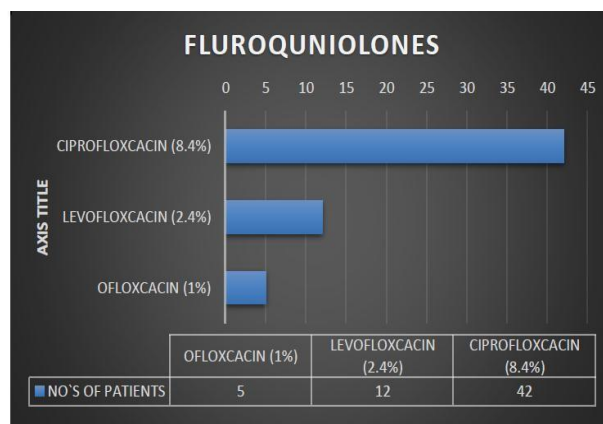
**Tetracycline Utilisation**

Doxycyclin was given in 4% of cases and tetracycline was indicated at an frequency of 0.4%.

**Table 3: Quinalones Utilisation.**

ANTIBIOTIC	PERCENTAGE OF UTILISATION
1)CIPROFLOXCACIN	8.4%
2)LEVOFLOXCACIN	2.4%
3)OFLOXCACIN	1%

Ciprofloxacin was given in 8.4% cases, levofloxacin in 2.4% cases and ofloxacin being the less commonly prescribed among this category was found to be 1%.



**Figure 1: Quinolones Utilisation.**

**Table 4: Rationality Assessment.**

Rationality assesment	No`s of cases	Result in Percentage
Rational	382	76.4%
Irrational	118	23.6%

Patient distribution based on sex: on assessing the demographic data of patients (500 patients) it was found males constituted for 75.2% of cases whereas females constituted for 24.8% of cases.

**Rationality Assessment Among Penicillins.**

It was found that almost all antibiotics prescribed of penicillin category were at least 65% rational, piperacillin+tazobactam was prescribed most rationally with a rationality percentage and least was of vancomycin whose rationality was 66%.

**Rationality Assessment Among Cephalosporin's.**

Among cephalosporin cefixime and cefpodoxime were indicated 100% rationally but ceftriaxone was indicated 74% rationally and 26% irrationally.

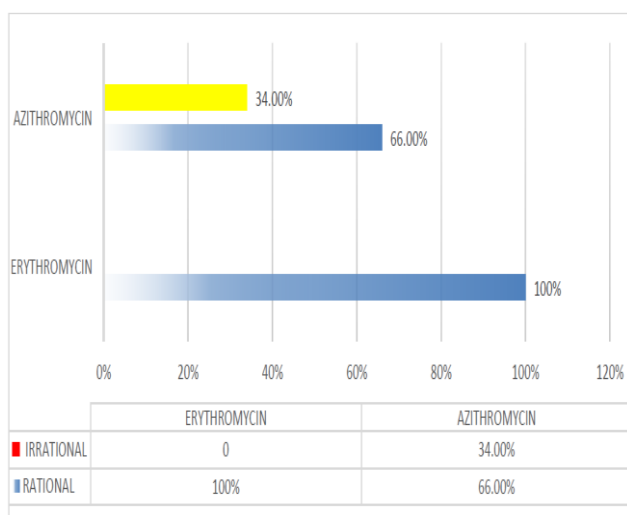


Figure 3: Rationality Assessment of Macrolides.

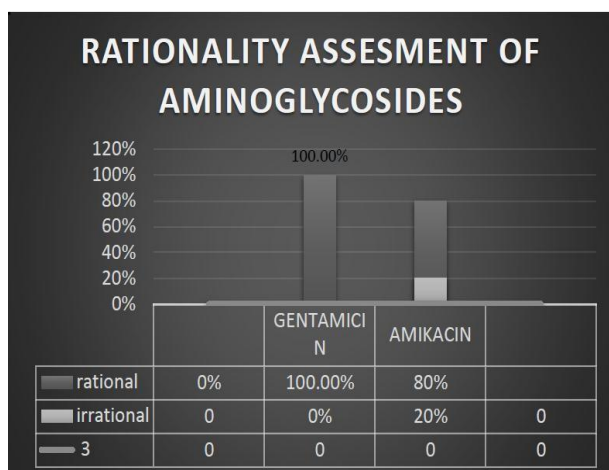


Figure 4: Rationality Assessment Of Aminoglycosides.

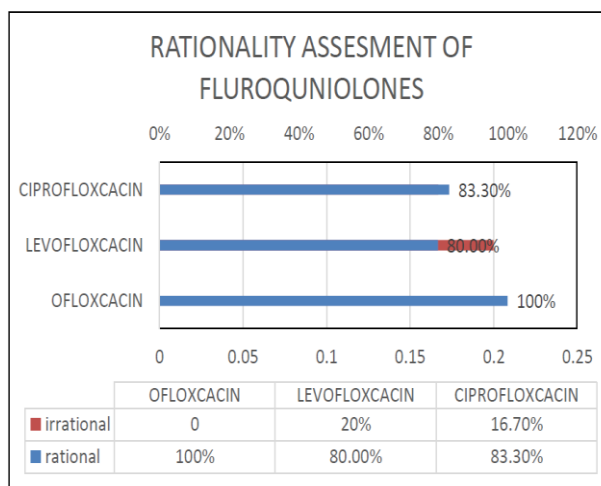


Figure 5: Rationality Assessment of Fluoroquinolones.

**Antimicrobial Resistance Prevalance**

Culture sensitivity was carried out only among 50 cases out of 500. and it was found that 49% of sensitivity cases were treated with appropriate antibiotic as per the culture sensitivity report. were as remain ant 51% were treated with other antibiotics. Out of 50 cases which have been through culture sensitive test it was found that 29 reports indicated resistance to amoxicillin , 16 strains were resistant to ciprofloxacin, Amikacin resistant strains were 2 and piperacillin resistant strains were 12.

**Antibiotics Utilisation In Various Biotics.**

It was found that majority of antibiotics were indicated on prophylactic basis. An on basis of empirical therapy antibiotics were indicated majorly in respiratory track biotics which accounted for 15% of cases, followed by urinary tract biotics in 8% of cases and 7% of crebral bioticsan gastrointestinal biotics. on basis of secondary biotics 3% of cases were indicated with antibiotics.

**DISCUSSION**

Antimicrobial are the most regularly recommended drugs among hospitalized patients, the present study was an imminent observational study to screen the antibiotic utilization in a general hospital, absolute 500 patients were considered for the study among them 382 were observed to be guys and 118 were females . Which was like different studies were male were power was seen.<sup>[1]</sup>

Antimicrobials were widely utilized as a part of general solution to treat irresistible cases irrational medicines and poly drug store of against microbials lead to rise of medication resistance and treatment disappointment and expanded patient's dismallness and mortality, among all the endorsed drugs cephalosporin's (53.8%) were broadly recommended thinks about to other gathering of anti-biotic agents took after by azithromycin (18%) trailed by penicillin and fluoroquinolones which demonstrates comparative results as reported by john et al.<sup>[11]</sup>

Among cephalosporin's greater part endorsed were Ceftriaxone (93%), cefixime (4%) and cefpodoxime (3%) comparative results were appeared by badar et al.<sup>[19]</sup>

Among second line anti-microbials penicillin subordinate piperacillin+tazobactam mix was endorsed explanation behind picking the above medication is that its wide range action and it is dynamic against life forms which has demonstrated imperviousness to cephalosporin's.

Irrational solutions of antibiotic is the real medicinal services issue and weight to the general public which prompts improvement of resistance and expansion in social insurance cost. Past study has demonstrated that anti-biotic agents were endorsed for non-irresistible conditions. Comparative result was additionally seen in over study, that anti-biotic agents were recommended for conditions were antimicrobials in not required.

### CONCLUSION

A wide range of clinical dosing and assortment of medications were used from different medications classes results demonstrates that cephalosporins were broadly utilized, among cephalosporins ceftriaxone was for the most part recommended took after by azithromycin and afterward piperacillin+tazobactam mix was endorsed on third place.

On surveying the judiciousness of solutions it was found that majority of the medicines were observed to be soundly recommended however rest had a few or the other unreasonability.

Less cases were evaluated for society affectability trial of which barely any cases were shown with touchy anti-biotic The study presumes that treatment actualized without society affectability in the majority of cases may prompt unreasonable treatment which would prompt resistance as much of the time it has been seen that numerous anti- microbials have been shown on premise of prophylaxis and experimental treatment. After assessment of above results that for the accomplishment of discerning utilization of antibiotic for administration of disease cause by microorganisms. As a matter of first importance society affectability testing is extremely important to perceives the microorganism and select the proper anti-microbial. so one can diminish the possibility of resistance and abatement expense of the treatment and additionally diminish healing center visits. So by giving mindfulness one ought to minimizes those issues which are regular at ward level, similar to irrational utilize, Advising ought to be performed at ward level. Mindfulness projects ought to be propelled and classes ought to be led. Pamphlets and Medication announcements about the sound utilization of anti-biotic agents and its impact on group. Financially savvy solution ought to likewise be supported. All these reality are conceivable when Clinical Drug specialist work alongside the doctor at ward level.

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