IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A STUDY ON ANTIBIOTICS PRESCRIBING PATTERN IN THE IN-PATIENT DEPARTMENTS USING THE WHO PRESCRIBING INDICATORS IN A TERTIARY CARE HOSPITAL

Dr. S. Ooha, Chandaka Jyothi, Y. Mohan Ranga, Barsha Madhu, E. Akhila Sree, Harshita Lall

Sri Venkateswara College of Pharmacy, RVS Nagar, Tirupati Road, Chittoor, Andhra Pradesh

Abstract:

The study is carried out to evaluate the use of antibiotics and categorize them as WHO AWaRe classification of antibiotics. It is a prospective, cross-sectional study which is conducted in the in-patient department of general medicine, surgery, orthopaedics, ophthalmology, paediatrics, and ENT conducted for six months using the medical records and case sheets of the patients available in a government hospital in the Chittoor region of Andhra Pradesh.

Study participants: The sample size of the study is approximately(N)=500-600. In this study, all age groups are taken into consideration except the pregnant and lactating women and the mentally retarded patients.

Results: The average number of drugs per prescription was found to be: 5.0%. Percentage of drugs prescribed by generic names: >95%, maximum all drugs are prescribed by their generic names.

Conclusion: The WATCH group antibiotics are mostly given to adult patients compared to the paediatrics. The ACCESS group antibiotics are mostly given to the paediatrics. Most commonly the antibiotics are given in the injection forms.

Key words: WHO, EML, Access, Watch, Reserve, Rational use, ASPs.

Introduction:

Antibiotics are the chemical substances produced by the micro-organisms as metabolites that inhibits the growth of other micro-organisms.

According to WHO, antibiotics are the medicines used to prevent and treat bacterial infections.

RATIONAL USE OF ANTIBIOTICS:

Antibiotics are the chemical substance used to treat bacterial infection, but nowadays antibiotics are mis-prescribed by the physicians for infections caused by various micro-organisms such as viruses, fungi, etc. So, by this there is a decrease in the antibiotic efficiency due to the increased antibiotic resistance against the drug.

ANTIBIOTIC STEWARDSHIP:

Antibiotic stewardship program is one of the key strategies to overcome antimicrobial resistance. It involves the careful, judicious, and responsible management of antimicrobial use. The Centre for disease control and prevention (CDC) defines antibiotic stewardship as a collection of commitments and behaviours, intended to improve infection therapy, thus lowering the risk of undesirable events.

GOALS of ASPs:

- Limit inappropriate use of antibiotics.
- To optimize clinical outcomes.
- To minimize toxicity.
- Reduces healthcare cost without compromising quality of care.

Essential medicine list: Essential medicines are those that satisfy the priority health care needs of a population. They are selected with due regard to disease prevalence and public health relevance, evidence of efficacy and safety and comparative cost-effectiveness. They are intended to be available in functioning health systems at all times, in appropriate dosage forms, of assured quality and at prices individuals and health systems can afford.

CLASSIFICATION OF ANTIBIOTICS:

- BASED ON THE ANTIMICROBIAL ACTIVITY:
    1. Bactericidal
    2. Bacteriostatic
- BASED ON THE BACTERIAL SPECTRUM OF ACTIVITY:
    1. Narrow spectrum
    2. Broad spectrum
- BASED ON THE ABSORBABILITY FROM THE SITE OF ADMINISTRATION TO ATTAIN SIGNIFICANT CONCENTRATION FOR THE TREATMENT OF SYSTEMIC INFECTION:
    1. Locally acting: Bacitracin, polymyxin, neomycin, etc.
    2. Systemic: Azithromycin, doxycycline, etc.

- BASED ON THE CHEMICAL NATURE:

  Based on the chemical nature, the antibiotics are classified into- Sulfonamides, quinolones and fluoroquinolones, beta-lactams, tetracyclines, macrolides, aminoglycosides.
  Sulfonamides are named after the presence of sulpha and an amide group which acts as a base for various molecules naming- sulfadiazine, sulfamethoxazole, etc.
  Quinolones and fluoroquinolones are the antibiotics which have a bicyclic core structure.
  Beta lactam antibiotics are the antimicrobial agents which contains a beta-lactam ring (a four membered lactam) as its basic structure. A lactam is a structure which contains a nitrogen atom, and a carbonyl group.

- BASED ON THE MECHANISM OF ACTION:

1. Aminoglycosides- inhibit protein synthesis
2. Cephalosporins- inhibit cell wall synthesis
3. Tetracyclines- inhibit protein synthesis
4. Penicillins- inhibit cell wall synthesis
5. Sulphonamides- inhibit folate synthesis
6. Fluoroquinolones- inhibit DNA replication
7. Macrolides- inhibit protein synthesis
8. Carbapenems- inhibit cell wall synthesis
9. Lincosamides- inhibit protein synthesis
10. Glycopeptides- inhibit cell wall synthesis

WHO- Access, Watch, Reserve (AWaRe) classification of antibiotics for evaluation and monitoring use, 2022

Access group:

- High activity against a wide range of commonly encountered susceptible pathogens.
- Lower resistance potential than antibiotics in the other groups.
- Recommended as essential first or second choice empiric treatment.
- Example: Amoxicillin, amoxiclav, amikacin, metronidazole, cloxacillin, chloramphenicol, clindamycin, cefadroxil, gentamycin, etc.

Watch group:

- Have higher resistance potential.
- Antibiotics are at relatively high risk of selection of bacterial resistance.
- These medicines should be prioritised as key targets of stewardship programmes and monitoring.
- Selected watch group antibiotics are recommended as essential first or second-choice empiric treatment options for a limited number of specific syndromes.
- Examples: Azithromycin, cefixime, ciprofloxacin, ceftriaxone, neomycin, rifampicin, etc.

Reserve group:

- Includes antibiotics and antibiotic classes that should be reserved for treatment of confirmed or suspected infections due to multi-drug resistant organisms.
- Reserve group antibiotics should be treated as “last resort” options.
- These antibiotics should be accessible, but their use should not be tailored to highly specific patients and settings when all alternatives have failed or are not suitable.
- Examples: Daptomycin, minocycline-4, polymyxin-B (IV and oral), colistin (IV and oral), omadacycline, linezolid, etc.

Methods:

Study design:

It is a prospective, cross-sectional study which is conducted in the in-patient department of general medicine, surgery, orthopaedics, ophthalmology, paediatrics, ENT.

Inclusion criteria:

- Patients with all age groups (age> 0 years).
- In-patients in the departments of General Medicine, paediatrics, surgery, orthopaedics, ophthalmology, ENT.
- In-patients receiving antibiotics.

Exclusion criteria:

- Out-patient departments.
- Patients with unconscious state, mentally retarded.
- Suffering with psychiatric diseases.
- Pregnancy and lactating women.
- Patients with serious infections such as tuberculosis and other autoimmune disorders.

Study period:

The study is conducted for 6 months.

Sample size:

Sample size of the study is approximately(N)=500-600

Data collection and screening:

The data is collected by observing the medical records and case sheets of the patients involved in the study. Information about the patient such as age, gender, and family history is screened. All the required hospitalisations were collected to obtain the prevalence.

Statistical analysis:

WHO PRESCRIBING INDICATORS:

- Average number of drugs per encounter.
  = total number of drugs prescribed / total number of encounters surveyed
- Percentage of drugs prescribed by generic names.
  = (number of drugs prescribed by generic names / total number of drugs prescribed) x 100
- Percentage of antibiotic prescribed.
  = (number of antibiotics prescribed / total number of drugs prescribed) x 100
- Percentage of encounters with an injection prescribed.
  = (number of injections prescribed / total number of drugs prescribed) x 100
- Percentage of drugs prescribed from EDL.
  = (number of drugs prescribed from EDL / total number of drugs) x 100

Results:

There was total 611 patients accounted with the use of antibiotics. Total number of drugs were found to be 3074, among them total number of antibiotics were found to be 799.

The average number of prescribed antibiotics per patient was found to be 5.0. In the surgical ward and general medicine, antibiotics were prescribed for more than 6 days for each patient whereas, the inpatients in other departments like paediatrics, ENT, ophthalmology, orthopaedics were prescribed with antibiotics for less than 6 days.

The percentage of antibiotics prescribed from the EML of WHO was found to be 47.9% (access group), 50.0% (watch group) and 0% (reserve group). The percentage of drugs prescribed by their generic names was 95%, maximum all drugs were prescribed by their generic names.

According to the data collected, the most commonly used route of antibiotic administration is in the injection form i.e., 72.7% of dosage forms prescribed.

From our study we found that, in department of paediatrics the combination of amoxicillin and clavulanic acid was prescribed more in the form of injection. In the department of general medicine and general surgery, Augmentin and ceftriaxone were given mostly in the form of injections.

- Average number of drugs per prescription: **5.0.**
- Percentage of drugs prescribed by generic names: **>95%, maximum all drugs are prescribed by their generic names.**
- Percentage of antibiotic injections prescribed: **72.7%**
- Percentage of drug prescribed from an essential drug list or formulary:

- **ACCESS GROUP: 47.9%**
- **WATCH GROUP: 50.9%**
- **RESERVE GROUP: 0%**

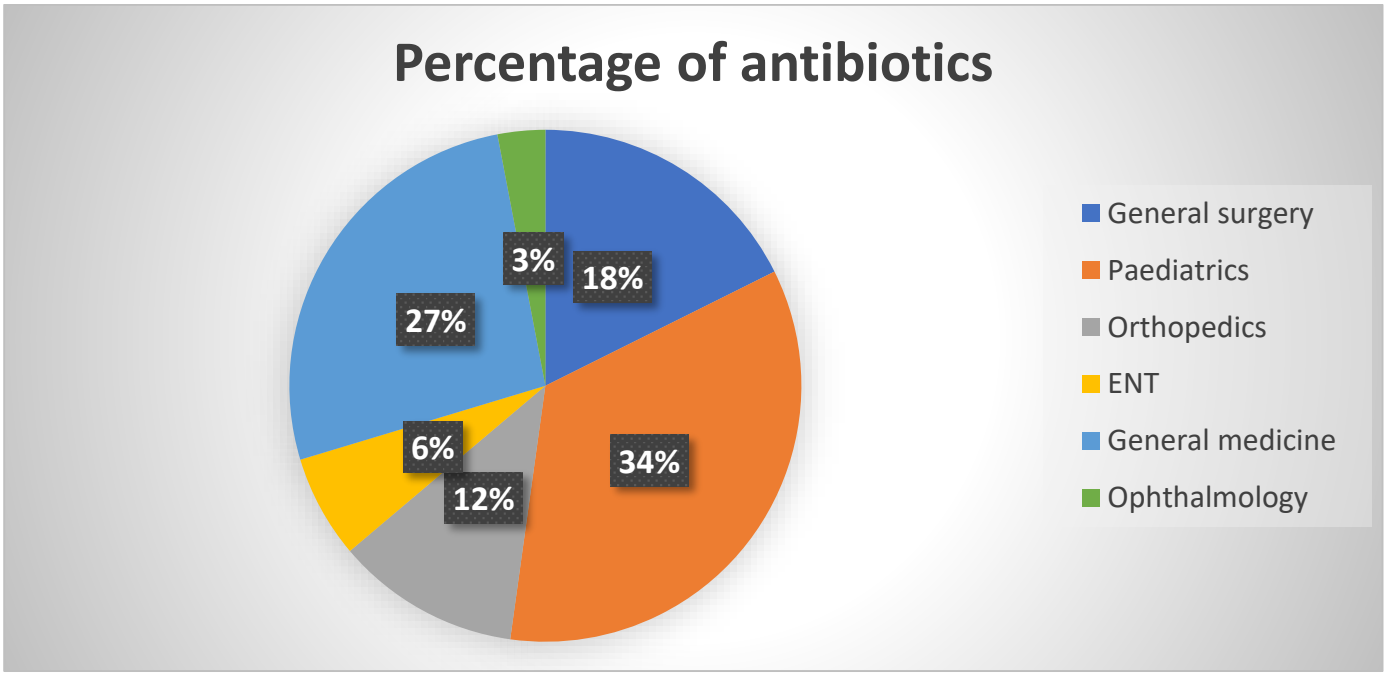

Fig. The pie chart shows the percentage of antibiotics prescribed in each department under study.

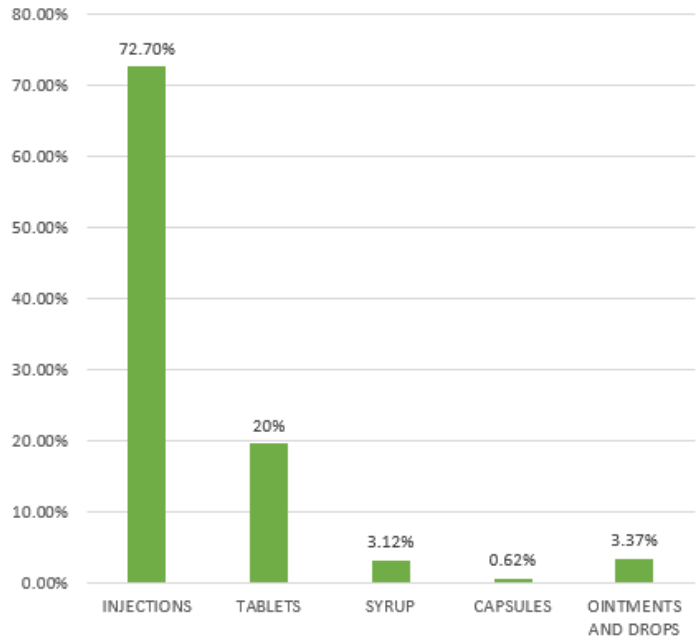

Fig. The bar graph shows the percentage of antibiotics prescribed in different dosage forms

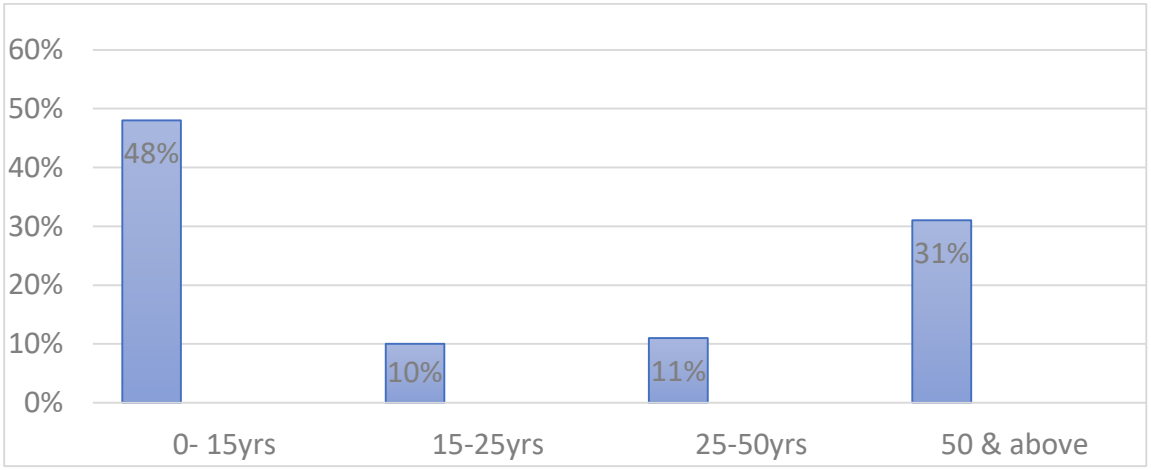

Fig. The bar graph shows the percentage of antibiotics prescribed according to the age groups.

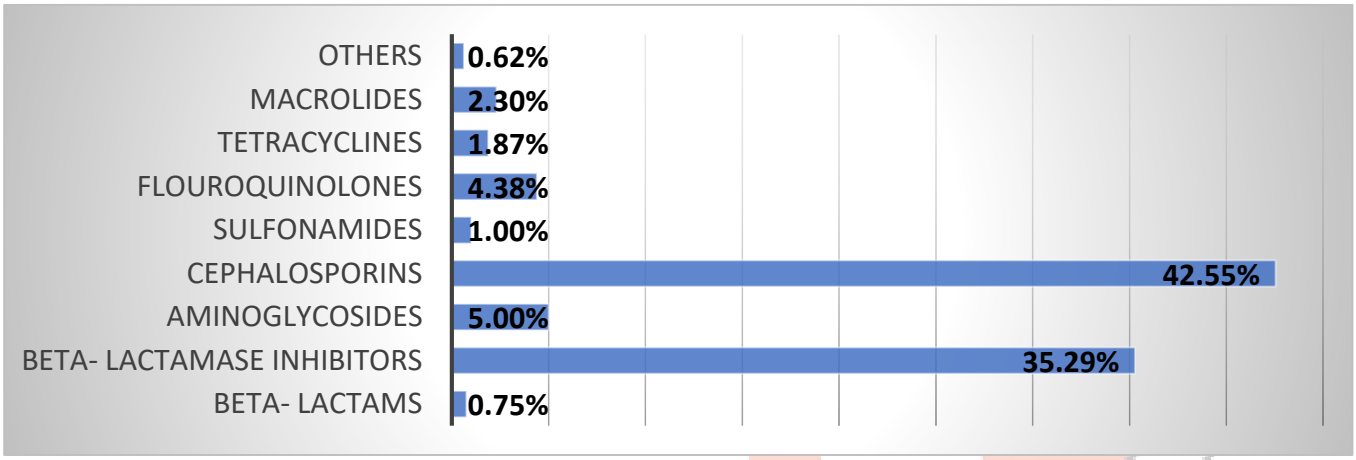

Fig. The chart shows the percentage of antibiotics prescribed based on their chemical nature.

Conclusion:

The following are the conclusions which are obtained through our study:

- The **WATCH group** antibiotics are mostly given to the **adult** patients compared to the paediatrics.
- The **ACCESS group** antibiotics are mostly given to the **paediatric**s.
- Most commonly the antibiotics are given in the **injection forms**.
- **Cephalosporins (such as ceftriaxone, cefixime, cefotaxime, etc.)** are the most preferred antibiotics among the other chemical classification of the antibiotics.

References:

1. **Ambili Remesh, Et.al. : "ANTIBIOTICS PRESCRIBING PATTERN IN THE IN-PATIENT DEPARTMENTS OF A TERTIARY CARE HOSPITAL", Activities of pharmacy practise, 2013, vol- 4, page no. 71-76: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6044109/]**
2. **Priyadharsini, Et.al. : "ANTIBIOTIC PRESCRIBING PATTERN IN THE OUT-PATIENT DEPARTMENT USING THE WHO PRESCRIBING INDICATORS AND AWaRe ASSESMENT TOOL IN A TERTIARY CARE HOSPITAL IN SOUTH INDIA", Journal of Family medicine and pharmacy care, 2022,vol- 11, page no.:74-78: [https://journals.lww.com/jfmpc/Fulltext/2022/01000/Antibiotic_prescribing_pattern_in_the_outpatient.12.aspx]**

3. **Thomas Opoku Darkwah, Et.al. : "ASSESMENT OF PRESCRIBING PATTERNS OF ANTIBIOTCS USING NATIONAL TREATMENT GUIDELINES AND WORLD HEALTH ORGANISATION PRESCRIBING INDICATORS AT THE GHANA POLICE HOSPITAL: A PILOT STUDY", Department of pharmacy,2021,vol-1,page no.6- 68: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8486929/]**

4. **Rana Kamran Mahmood, Et.al.: "Systematic review: study of the prescribing pattern of antibiotics in outpatients and emergency departments in the Gulf region", Frontiers in Pharmacology ,2020, vol-11, page no. 1-9: [https://www.frontiersin.org/articles/10.3389/fphar.2020.585051/full]**

5. **Elvis Dzelamonyuy Chem, Et.al.: "Prescribing patterns and associated factors of antibiotic prescription in primary health care facilities of Kumbo east and west health districts" 2018, vol-14, page no. 43-50: [https://doi.org/10.1371/journal.pone.0193353]**

6. **Gautam Sahu, Et. Al.: "Drug utilization pattern of antidiabetic drugs among indoor diabetic patients in a tertiary care teaching hospital, Jorhat", Biomedicine, 2021, vol- 4: [https://biomedicineonline.org/index.php/home/article/view/331]**