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RESEARCH ARTICLE

A STUDY OF PRESCRIBING PATTERN OF ANTIBIOTICS IN A TERTIARY CARE HOSPITAL USING WORLD HEALTH ORGANISATION PRESCRIBING INDICATORS- A RETROSPECTIVE CROSS-SECTIONAL STUDY

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ABSTRACT

Background : Antibiotics are one of the most important discoveries in the field of medicine and are widely used against infectious diseases. In developing countries like India, the antibiotics are the highly consumed medicines, and irrational use of antibiotics is a common practice. Misuse of antibiotics has become even more during COVID-19 pandemic. Understanding the prescription pattern of antibiotics is crucial in tackling irrational prescription and antibiotic resistance.

Objectives:

- 1) To study the prescription pattern of antibiotics.
- 2) To compare prescription pattern with WHO indicators.

Methods and Methodology: A retrospective, cross-sectional study. Total of 600 pre-prescriptional data were studied in the department of General medicine in a tertiary centre, Tirupati, on in-patient basis.

Inclusion Criteria: 1) Prescribable data of study sample with the age group greater than 18 years of both males and females. 2) Prescriptions of common infectious diseases such as enteric fever, malaria, dengue, Acute gastro-enteritis, Pyrexia of unknown origin, URTI, LRTI, dysentery has been included. 3) Prescriptions with diagnosis. **Exclusion criteria:** 1) Prescription papers in which the handwriting of prescriber was illegible to identify medication clearly. 2) Prescription papers that did not contain medication. 3) HIV/HbSAg /TB /Auto-immune diseases. 4) Chronic renal disease (CKD). 5) Cancer.

Study Method: A total of 600 prescription papers were studied. Specific prescriptions papers were selected randomly. A detailed checklist containing patient-related information, medication related with diagnosis has been prepared. WHO prescribing indicators with their standard values were utilised to measure rational use of drugs with due focus on antibiotic prescribing patterns with study period of 6 months. No culture and sensitivity tests are done before starting antibiotics. Approval of Institutional ethics committee has been taken before starting the study. **Results:** Socio-demographic characteristics have been recorded prior to the study. Drug dose, frequency of administration, route of administration, duration of treatment have been recorded. WHO-prescribing indicators : 1) Average number of drugs per encounter is 4.2. (optimal value 1.6-1.8). 2) Percentage of encounter with antibiotics is 126.1% (optimal value 20.0-26.8%) 3) Percentage of encounter with injections is 94.33% (optimal value 13.4-24%). 4) Percentage of drugs prescribed by generic name is 100% (optimal value 100%). 5) Percentage of drugs from Essential medicine list is 100% (optimal value 100%). Frequently prescribed antibiotic injectable was CEFTRIAXONE constituting 49.2% **Conclusion:** Our study concluded that prescribing pattern of antibiotics deviates from and is non-compliant with standard endorsed the WHO. "SUPERBUG-infections" are great threat to the world, due to irrational use of antibiotics. This problem may be reduced by developing an ANTIBIOTIC STEWARDSHIP PROGRAMME, introducing practice of antibiotics with the aid of culture and sensitivity tests and developing institutional guidelines.

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INTRODUCTION

Antibiotics are corner stone tools in health-care delivery in hospitals and saves countless lives and is one of the most important discoveries in field of medicine. Most of the antibiotics now in use have been discovered more or less by chance, and their mechanisms of action have been elucidated only after discovery. In developing countries like India, the antibiotics are the highly consumed medicines, and irrational use of antibiotics is a common practice. Inappropriate use of antibiotics contributes to the development of antibiotic resistance, which accelerates the emergence and spread of resistant microorganisms and has significant impact on treatment outcome (WHO, 2012). Currently, the centers for disease control and prevention (CDC) warns health care professionals to work in improving antibiotic prescribing practice and use in human health care, and recommends the establishment of antibiotic stewardship programme (ASP) (CDC, 2020). There is no doubt that antibiotics have vital role in health care systems world-wide, upto half (20-50%) of prescribed antibiotics are inappropriately consumed (Gottlieb, 2011). Inappropriate use of antibiotics is prevalent, resulting in antibiotic resistance, which is a big challenge in the society.

Patient with antibiotic resistant infections are more likely to experience ineffective treatment, recurrent infections, delayed recovery or even death (Dyar, 2017; Kimang'a, 2012). About 6.5% of morbidity and mortality of hospital admissions is related to inappropriate prescribing antibiotics, although most of these are preventable (Aidara-Kane, 2018). And misuse of antibiotics has become even more during COVID-19 pandemic. Therefore understanding the prescription pattern of antibiotics is crucial in tackling irrational prescription and antibiotic resistance.

AIMS AND OBJECTIVES:

- To study the prescription pattern of antibiotics.
- To compare prescription pattern with WHO indicators.

METHODS AND METHODOLOGY

A retrospective, cross-sectional study.

STUDY SETTING: Total of 600 precriptional data were studied in the department of General medicine in a tertiary centre, Tirupathi, on in-patient basis.

STUDY PERIOD: The Study period was six months of which precriptional data has been collected from the period of January 2021 to June 2021.

INCLUSION CRITERIA: 1) Prescriptional data of study sample with the age group greater than 18 years of both males and females. 2) Prescriptions of common infectious diseases such as enteric fever, malaria, dengue, Acute gastro-enteritis, Pyrexia of unknown origin, URTI, LRTI, dysentery has been included. 3) Prescriptions with diagnosis.

EXCLUSION CRITERIA: 1) Prescription papers in which the handwriting of prescriber was illegible to identify medication clearly. 2) Prescription papers that did not contain

medication. 3) HIV/HbSAg/TB/Auto-immune diseases. 4) Chronic renal disease (CKD). 5) Cancer.

STUDY METHOD: A total of 600 prescription papers were studied. Specific prescriptions papers were selected randomly. A detailed checklist containing patient-related information, medication related with diagnosis has been prepared. WHO prescribing indicators with their standard values were utilised to measure rational use of drugs with due focus on antibiotic prescribing patterns. No culture and sensitivity tests are done before starting antibiotics.

ETHICAL CONSIDERATION: Approval of Institutional ethics committee has been taken before starting of the study

RESULTS

Table 1. Patient related information

Variables	No.	Percentages
Name	600	100%
Age	600	100%
Sex	600	100%
Medical record no	600	100%
Weight	600	100%

Table 2. Drug Relating Parameters

Variables	No	percentages
Drug with dose	600	100%
Drug with roa	600	100%
Drug with frequency	600	100%
Drug with duration	600	100%

Table 3. Who-indicators of prescribing antibiotics

	Percentages	Standards
Average no. Of drugs per encounter	4.2	1.6-1.8
Percentage of encounter with antibiotics	126.1%	20.0-26.8%
% Of encounter with injections	94.33%	13.4-24%
% Of drugs prescribed in generic name	100%	100%
% Of drugs from eml	100%	100%

Table 4. Most commonly prescribed injectables in percentages

Antibiotic-group	Percentages (%)
Pencillin	5.83%
Cephalosporins	49.2%
Macrolides	1.94%
Aminoglycosides	1.23%
Tetracyclines	0.3%
Quinolones	18.55%
Anti-protozoals	22.79%
Others	

DISCUSSION AND ANALYSIS

Table 1 represents patient related information with regarding to socio-demographic factors and recordings are satisfactory. Table 2 denotes drug related parameters such as dose, frequency, route of administration and all are noted well. Table 3 represents WHO indicators of prescribing antibiotics: 1) Average number of drugs per encounter is 4.2. (optimal value 1.6-1.8). 2) Percentage of encounter with antibiotics is 126.1% (optimal value 20.0-26.8%). 3) Percentage of encounter with injectable antibiotics is 94.33% (optimal value 13.4-24%). 4).

Graphical representation of injectable antibiotics

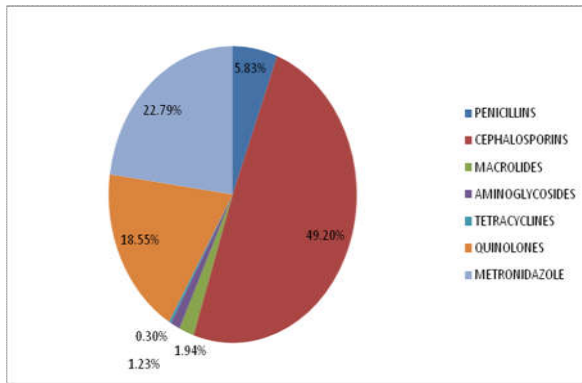


Table 5. most commonly prescribed oral antibiotics in percentages

Antibiotic-group	PERCENTAGES (%)
Pencillin	13.08%
Cephalosporins	30.89%
Macrolides	10.99%
Tetracyclines	12.04%
Quinolones	32.98%
Metronidazole	2.1%

Graphical representation showing oral antibiotics

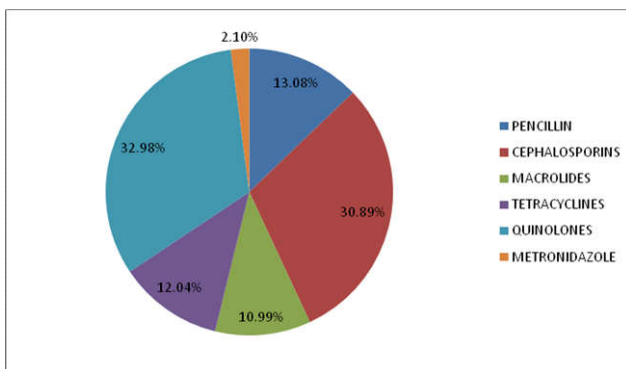


Table 6. Most common diagnosed diseases for antibiotic prescription

Diagnosis	percentages
Viral fever	87%
Acute gastro-enteritis	83%
Dengue	11%
Typhoid fever	33%
Urti	21%
Lrti/pnuemonia	24%
Uti	18%

Percentage of drugs prescribed by generic name is 100% (optimal value 100%). 5)Percentage of drugs from Essential medicine list is 100%(optimal value 100%).So,there is great deviation of parameters in prescribing antibiotics according to WHO-standardised parameters ,which is of great concern and emergence of antibiotic resistance will be the ultimate result. The positive things to be noted are all drugs are from EML and written in generic names.Table.4 indicates frequently prescribed antibiotic injectable was CEFTRIAZONE constituting 49.2%. Table. 5 indicates frequently given oral antibiotics are quinolone group of drugs. Table 6 denotes most common diagnosed disease for prescribing antibiotic for viral fever which indicates irrational use of antibiotics to treat for simple viral fevers by the clinicians.

Similar results were found in the study conducted by Ramanath et al (2013)., and Akram et al. (2012), that cephalosporins are prescribed in large percentages of population. According to WHO-AWARE classification CEFTRIAZONE comes under WATCH-GROUP with high risk of selection of bacterial resistance and they are prescribed only for specific limited infection.These should be prioritized as key targets of antibiotic stewardship programme.In another study ciprofloxacin,metronidazole and pencillin G are most prescribed antibiotics (1997). (NOTE:Metronidazole has been included as it is both anti-protozoal and anti-bacterial)

LIMITATIONS OF THE STUDY: Our study has certain limitations .As the prescribing antibiotics pattern was investigated in a single hospital,the results cannot be generalized .The study was conducted only on inpatients and it may not represent out-patients.

CONCLUSION

Our study concluded that prescribing pattern of antibiotics deviates from and is non-compliant with standard endorsed the WHO.And the clinicians attitude of writing antibiotics in patients prescription for simple viral fevers should be changed.“SUPERBUG-infections” are great threat to the world, due to irrational use of antibiotics and upcoming challenge to health-care departments.This problem may be reduced by developing an ANTIBIOTIC STEWARDSHIP PROGRAMME,introducing practice of antibiotics with the aid of culture and sensitivity tests and developing institutional guidelines.Further, studies are needed to explore the knowledge and skills to correct physicians attitude towards prescription.

ABBREVIATIONS

WHO-world health organization; ASP-Antibiotic Stewardship programme

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