

A prospective study of antimicrobial drug prescribing pattern in medicine outpatients of a tertiary care hospital in Chhattisgarh.

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Abstract: Background: The burden of infectious disease is a global problem and Indian population faces a significant number of morbidity and mortality due to this. To overcome this burden antimicrobial drugs are widely used in health care settings but in past few years overwhelming practice of these drugs created unnecessary emergence of resistance and adverse drug reactions. The rationality of usage of these drugs is being faded. This study was thus undertaken to evaluate error in antimicrobial prescribing pattern so that we can suggest some possible remedies at least in our hospital settings.

Methods: The prospective study was carried out for a period of 3 months in medicine outpatient department of Medical college hospital, Raigarh. The prescriptions having at least one antimicrobial drug prescribed were taken for the study. The collected prescriptions were analyzed in terms of legibility, demographic details of patients, pharmacological aspect of drugs and WHO prescription indicators.

Results: In analysis of prescription we noticed that the average number of antimicrobials per prescription (1.51%) as well as their total percentage (35.83%) was higher than WHO prescription indicators. Maximum drugs were from national essential drug list but only 21.55 percentage of drugs were in their generic names. Among the prescribed drugs penicillins and cephalosporins were leading the list. Respiratory infections were highest among provisional diagnosis.

Conclusion: Irrational prescribing is commonest prescribing error, the prevention of which is quite possible. Regulatory authorities should take necessary steps to improve quality of prescriptions so that these live saving drugs should not be misused. The introduction of standard treatment guidelines, audits and upgrading undergraduate curriculum can surely overcome the misuse of these antimicrobials.

Key words: Antimicrobial, rational, generic, resistance.

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I. Introduction

At present Antimicrobial drugs are the frequently prescribed drugs in hospital outpatients.¹ India tops the world in having highest number of patients suffering from infectious disease.² According to WHO usage of antimicrobials should not exceed 20 percent in outpatient department.³ Studies have found that in India the usage of antimicrobials is much higher and it ranges from 30-60 percent.⁴ Lack of adequate knowledge and unavailability of treatment guidelines led to excess use of these drugs.⁵ This resulted in wastage of resources, emergence of resistance and occurrence of adverse drug reactions.⁶ To check irrational prescribing of antimicrobials Schedule H1 was introduced in India under Drug and Cosmetic Act 1945 by the regulatory agencies.² Till date several retrospective and prospective studies have been conducted to audit prescriptions for usage of antimicrobials. Almost every study found irrational usage of these drugs.⁷⁻⁹ But still we need more studies at institutional and community level so that a comprehensive data of nationwide use of these drugs will be available. Our study thus will add on to the existing available data of antimicrobial prescription pattern and may help the regulatory authorities in upcoming days for taking necessary steps to promote rational use of antimicrobials.

II. Materials And Methods:

This prospective observational study was carried out for a period of 3 months. It commenced from 1st March 2018 to 31st May 2018 in medicine outpatients of LSLAM Government Medical College Hospital, Raigarh. Patients of either sex and age seeking care in medicine outpatient department of Medical college hospital Raigarh were included in the study. Patients requiring admission in medicine department for various reasons were excluded from the study. A total number of 911 OPD prescriptions were collected from pharmacy

department of Medical College Hospital. Based on data in these prescriptions analysis was done on various parameters like

1. **Legibility of prescription:** whether all parts of prescription were clear for reading or not.
2. **Demographic details of patients:** Age and sex distribution
3. **Pharmacological aspects like**
 - A) Distribution of infection according to body system
 - B) Antimicrobial prescribing pattern
 - C) Dosage of antimicrobials.
 - D) Distribution of patients according to the number of AMAs Prescribed to them
4. **W.H.O prescribing indicators:**
 - A). Average number of drugs per prescription - to measure polypharmacy.
 - B) Percentage of antimicrobials in total prescribed drugs.
 - C). Percentage of drugs prescribed by generic names- to evaluate generic drug prescribing habits.
 - D). Percentage of drugs prescribed from essential medicine list - to see whether drugs were prescribed according to national drug policy.
 - E). Percentage of fixed dose combinations.

III. Results

In this study total 911 prescriptions were analyzed among which 689 prescriptions were legible (75.6%) which means they can be read comfortably without any help. 194 (21.29%) were legible after additional effort of health personnel. 28(3.07%) prescriptions were termed illegible which means handwriting of these 28 became difficult to read even with the help of health personnel. Due to this calculations were based on 883 prescriptions after excluding illegible prescriptions.

Figure 1: Legibility of prescriptions

57.08% patients (504) were males and 42.92 % (379) were females. 22.76% (201) were in <18 year age group, 67.61% (597) were adults and rest 9.63% (85) belong to geriatric age group.

Table no 1: Demographic profile of patients

Total of 737 patients were categorized according to diseases like Respiratory tract infections which consisted of 275 (37.31%) patients followed by 205 (27.81%) gastrointestinal infections, 100 (13.56%) genitourinary infections, 99 (13.43%) pyrexia of unknown origin (PUO), 38 (5.15%) surgical infections and 20 (2.71%) patients in miscellaneous category were included

Figure 2: Distribution of infection according to body system

In 883 legible prescriptions total 3718 drugs were prescribed with an average of 4.21 drugs per prescription. 1332 drugs were antimicrobial agents which comprise 35.83 percent of total prescribed drugs . The average number of antimicrobials per prescription was 1.51.

About 96.62(1287) prescribed antimicrobials were from national list of essential medicines and 21.55 %(287) drugs were prescribed in their generic names. Almost 33.7%(449) drugs were administered in fixed dose combinations.

Table no 2: WHO prescription parameters

In total 1332 prescribed antimicrobial drugs, 81.23% drugs (1082) were in oral dosage form, 16.07% (214) injections and 2.67% (36) were topical agents.

Figure 3: percentage of routes through which total antimicrobial drugs were prescribed

After analysis of 1332 prescribed antimicrobials 19.67% were penicillins which is highest among all. It was followed by cephalosporins (15.17%), nitroimidazoles (13.74%), antimycobacterials (12.76%), fluoroquinolones (8.11%), macrolides (7.66%), antimalarials(6.16%), antihelminths (5.86%), tetracyclines (4.43%), antifungals(2.48%), Antivirals(1.95%), Glycopeptide antibiotic(1.05%) and Miscellaneous (0.98%).

Figure 4 : Percentage of prescribed antimicrobials according to systems in text books of Pharmacology

IV. Discussion

Antimicrobial drugs are life saving medicines from the era of penicillin to till date. In many studies of prescription evaluation they emerged as highest among prescribed drugs in outpatient departments.¹ In our study the percentage of prescribed antimicrobials is 35.83% which also stands highest. The WHO guideline permit upto 20 percent practice of these drugs in any outpatient department.³ The average number of antimicrobial per

prescription and number of Injectable was higher than WHO guidelines.³ Similar findings were found in some previous studies.¹⁰ These overwhelming prescription practice will only increase incidence of resistance and unwanted adverse drug events.¹¹ Some of respiratory and gastrointestinal infections in outpatient setting are of self remitting viral for which antimicrobials are rarely needed. Culture sensitivity testing is another criteria before prescribing antimicrobials. A majority of prescriptions were lacking advise for culture sensitivity.

In our study though a great number of drugs were prescribed from NLEM, still a small percentage of drugs were prescribed in generic names. The practice of branded medicines have been raised in last few years according to some studies. This may indicate that prescribing habits are being modified by drug manufacturing agencies for profits. This may increase cost burden among consumers. Practice of generic medicines decrease the incidence of dispensing error.¹²

In prescribed antimicrobials penicillins were highest followed by cephalosporins. This pattern was observed in some previous studies also.¹³ In some studies cephalosporins were leading followed by penicillins.¹⁴ Like previous few studies the majority of infections in our study are of respiratory origin where these beta lactam antibiotics are widely used.

V. Conclusion

The excessive irrational use of antimicrobial drugs in past few years have faded the concept of magic bullet by Paul Ehrlich as number of adverse drug reactions and resistance is in peak. To improve rational use of these drugs measure like periodic auditing should be performed. Implementation of standard treatment guidelines and weekly meeting of clinicians and pharmacologist can recommend suitable guidelines in any health care settings. As a preventive measure undergraduates should be taught for rational antimicrobial prescribing.

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Ethical approval: The study was approved by the Institutional Ethics Committee.

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Figure 1: Legibility of prescriptions

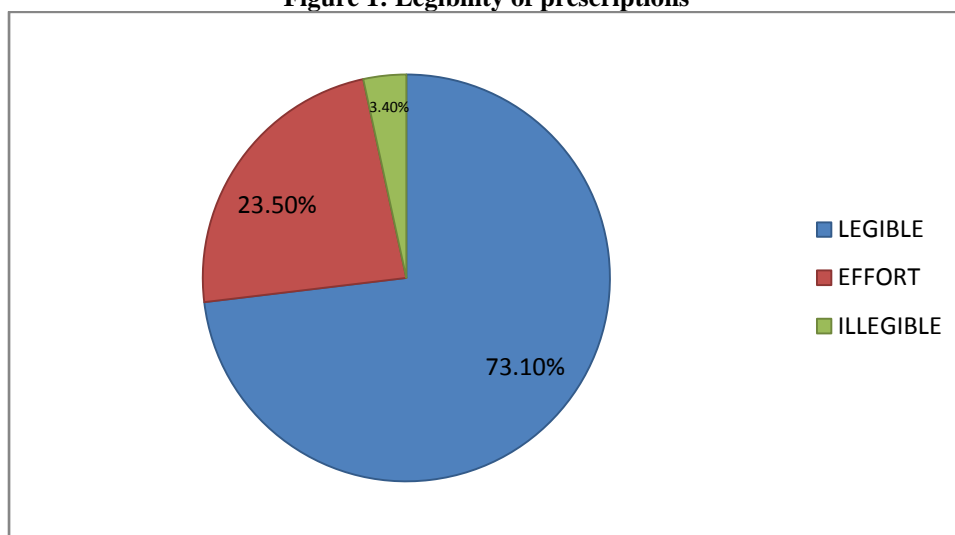


Table no 1: Demographic profile of patients

Age distribution	Percentage
<18 year age group	24.6% (246)
19-65 year age group	62.2% (622)
>65 year age group	13.2% (132)
Sex Distribution	Percentage
Male	52.4%
Female	47.6%
Transgender	-----

Figure : 2 Distribution of infection according to body system

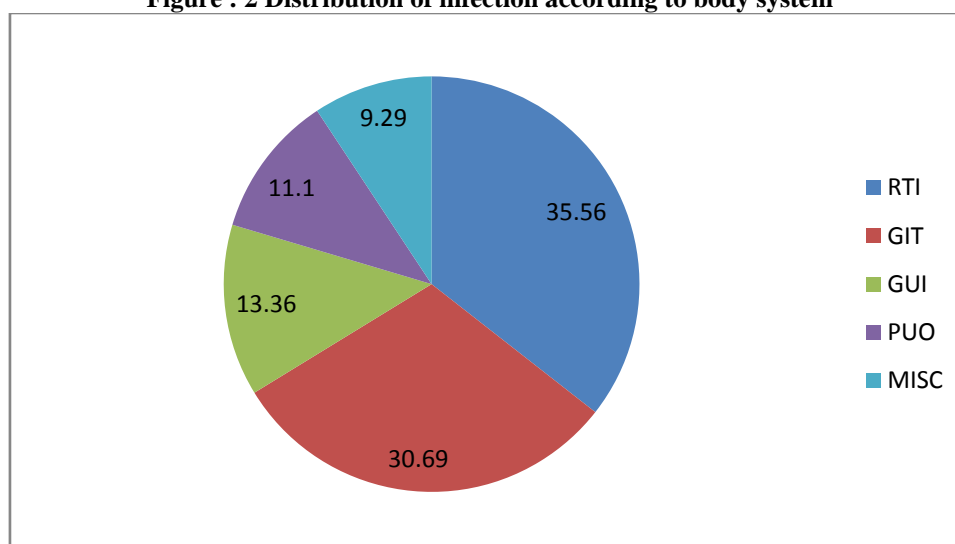


Table no 2: WHO prescription parameters

Prescription Parameters	Percentage
Average number of drugs per prescription	4.21
Average number of antimicrobials per prescription	1.51
Antimicrobials prescribed from NLEM	96.62 % (1287)
Antimicrobials prescribed in generic name	21.55% (287)
Fixed dose combinations of antimicrobials	33.7% (449)

Figure 3: percentage of routes through which total antimicrobial drugs were prescribed

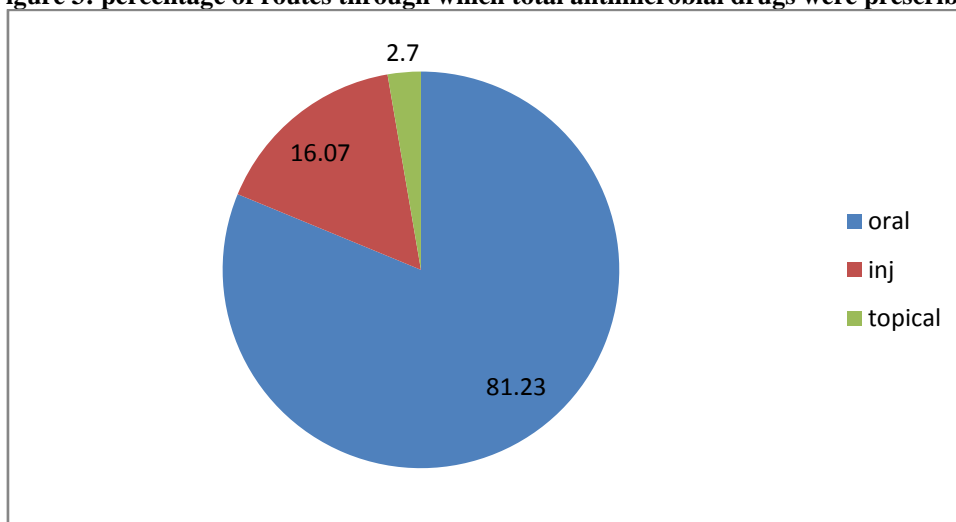
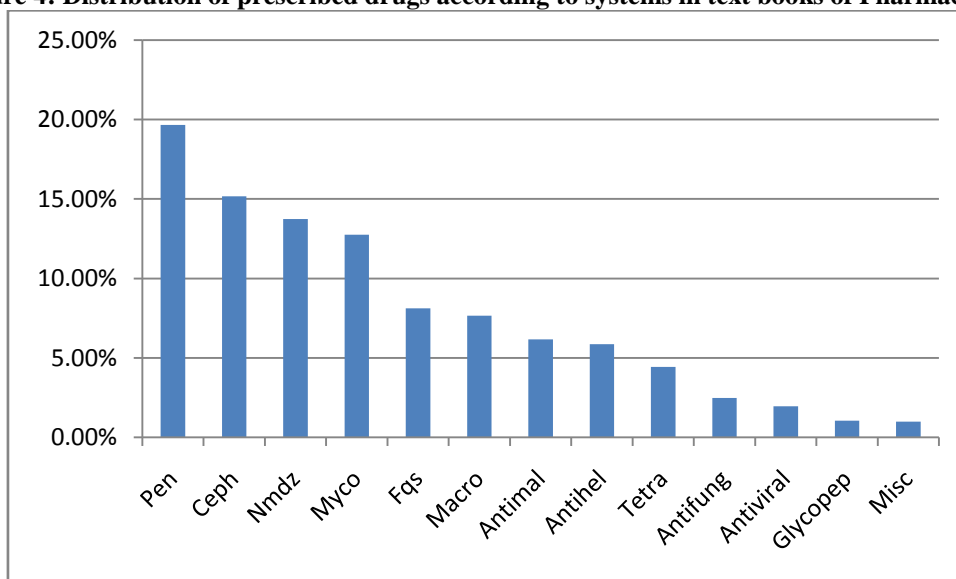


Figure 4: Distribution of prescribed drugs according to systems in text books of Pharmacology



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