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Investigation of antibiotic usage pattern: A prospective drug utilization review

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ABSTRACT

The purpose of the present study is to evaluate the pattern of antibiotics used in the outpatient department of a government hospital, and also to suggest necessary modifications in prescribing practices to achieve rational therapeutic practices. A prospective observational study for antibiotic usage pattern was carried out for one month. The relevant data on drug prescription of each patient was collected from the outpatient card. The demographic data, disease data and the utilization of different classes of antimicrobial agents as well as individual drugs were analyzed using descriptive analysis. A total of 830 antibiotics were prescribed to 327 patients, out of them 64.5% were male and 35.5% were female. The mean for age was 47.70 ± 19.01 . The average number of drugs per prescription was 5.01 ± 1.36 and number of antibiotics per prescription encountered was 2.53 ± 1.18 . Extensive polypharmacy (84.40%) was noticed among patients. Tablets contributed the highest proportion of drugs prescribed (51.98%), followed by injections (25.38%) and syrups (13.45%). The most commonly prescribed antibiotic was amoxicillin (18%). The common indications were fever (21.7%), diarrhea (21.1%), cough (14%) and cold (13.7%) and 78.5% of the prescribed antibiotics were present in the National List of Essential Medicines. Our study suggests that there is a considerable scope for improving prescribing pattern among the practitioners and minimizing the use of antibiotics in order to reduce the risk of antibiotic resistance of microbes. Formulation of an antibiotic policy for hospitals and by providing education to prescriber and hospital formulary is required.

Key words: Drug utilization, Antibiotics, Prospective

INTRODUCTION

Prescribing practices can be defined as the ability of health professionals to differentiate and discriminate among the various choices of drugs and determine the ones that will be most beneficial to their patient [1]. Enhancement of the medical standards at all level of the health care delivery system can improve the quality of life, hence, assessment of the quality of care through performance review has become a part of everyday clinical practice [2]. The observance of standards of medical treatment at all levels of healthcare delivery system is over seen by medical audit. The study of prescribing pattern is part of medical audit and seeks to evaluate, monitor, if possible, suggest modification in prescribing practices to make medical care rational and cost-effective [3]. All the information regarding antibiotic usage patterns should be collected and monitored so as to prevent problems that may arise from the multiple antibiotics available [4]. In developing countries, the cost of health care is a matter of major concern [5]. This is especially true for India, a developing country in South Asia. Due to the excessive and inappropriate use of antibiotics in hospitals, health care facilities and the community there is an increase development of bacterial resistance. In India, reports on antibiotic utilization at an institutional level include both cross-sectional [5] and longitudinal studies [6, 7] of prescribing patterns.

Antimicrobial drugs (AMDs) are among the most commonly prescribed therapeutic agents, accounting for 30-50% of drug prescriptions [8]. Higher incidence of infections in adults leads to higher use of AMDs, contributing to an overall increase in healthcare costs, as well as, potentially severe adverse drug reactions [1,9]. Monitoring and control of AMD use is a growing concern as AMD resistance is emerging global problem and prescribing practices lack uniformity. As a result, patients with AMD resistant infections are likely to experience longer and costlier hospital stays, requiring treatment with powerful AMDs that may cause additional and more severe side effects. This problem can be taken care of by implementing strict AMD policies. The detailed knowledge of AMD pattern is important before executing these policies into practice. Drug review programs are commonly accepted as a means to encourage appropriate use and may assist in controlling expenditures [1]. The easy availability of AMDs over the counter or self-prescribing also leads to irrational use, and finally, to drug resistance. It is possible to study drug utilization with help of WHO recommended prescribing and complimentary indicators [10].

Antimicrobials are among the most commonly prescribed drugs and the cautious use of AMDs is very important, as their unavailability or resistance can be life threatening [11]. Therefore, it is important to study the prescribing pattern of AMDs. The detection of problems with use of AMD in healthcare centres is the first step in evaluating the underlying causes and taking suitable remedial actions.

Objectives of the study

Primary objective:

1. To determine the frequency of drug usage of antibiotics.
2. To study the indications for which the drug was being prescribed.
3. To estimate the adherence of prescription pattern to National List of Essential Medicine (NLEM).

Secondary Objective: -

1. To determine the average drug encounter per prescription.
2. To determine the percentage dosage form usage of the antibiotics.
3. To assess relationship between patient demographics and prescription pattern.

MATERIALS AND METHODS

The study was conducted in a government hospital of Faridabad, Haryana, India. The study was designed to be a Prospective Observational Study of 1 month. The sample size was 327 patients. The participants enrolled in the study involved out-patients coming to the hospital, only after filling a properly written informed consent. Basic demographic information and details of the prescribed antibiotics and their prescribing patterns, diseases for which they were indicated, dosage form of antibiotics and whether mono- or multi-therapy is used, were documented in all patients. In view of collecting the aforementioned details, the data from outpatients was obtained every day from the clinical assessment records, including medical records and other relevant information sources as documented, including laboratory investigations. Descriptive analysis was carried out for the data obtained.

Selection Criteria

Inclusion Criteria

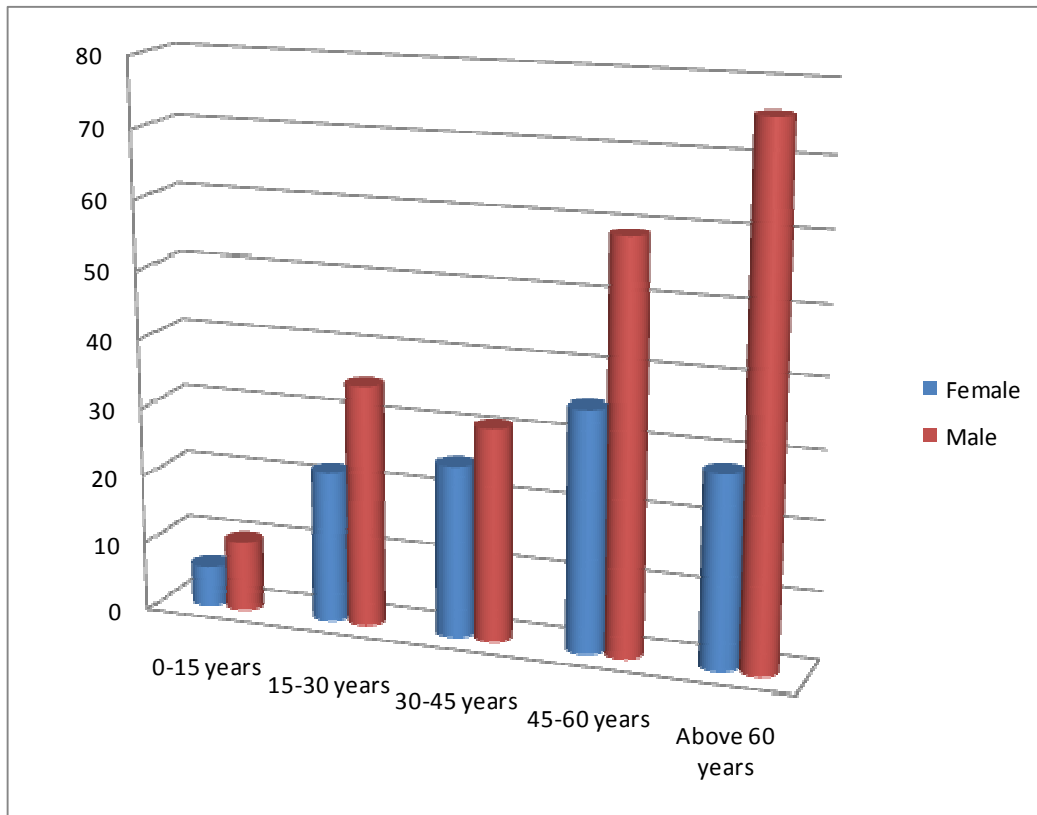
- Patients receiving any of the antibiotics.
- Patients of any age group.

Exclusion Criteria

- Patients with pregnancy and lactation.

RESULTS AND DISSCUSSION

A total of 327 patients were included in this study of one month. Out of 327 patients 64.5% were male and 35.5% were female .The mean for patient age was 47.70 ± 19.01 .The gender and age distributions of the patients admitted to the hospital are given in figure1.

Fig no. 1 Gender and age distribution of patients undergoing antibiotics therapy**Table No. 1 Prescribing frequency of antibiotics during study**

S.NO	Antibiotics	Patients	Percentage Usage %
1	Amoxicillin	59	18.04
2	Ciprofloxacin	52	15.90
3	Ofloxacin	48	14.67
4	Erythromycin	38	11.62
5	Azithromycin	28	8.56
6	Cefadroxil	21	6.42
7	Co-Trimoxazole	19	5.81
8	Doxycycline	16	4.89
9	Cefizime	13	3.97
10	Cephalexin	11	3.36
11	Tetracycline	9	2.75
12	Norfloxacin	7	2.14
13	Cloxacillin	4	1.22
14	Acyclovir	2	0.61

Several antibiotics had been prescribed to the patients, but the most commonly used antibiotics were amoxicillin (18.04%), ciprofloxacin (15.9%), ofloxacin (14.67%) and erythromycin (11.62%). So the average number of drugs per prescription was 5.01 ± 1.36 .

A total of 830 antibiotics had been prescribed during the study. Overall 51 patients (15.59%) were on monotherapy and 276 patients (84.4%) were on multitherapy. The number of antibiotics per prescription was found to be 2.53 ± 1.18 .

Table No. 2 No. of antibiotics prescribed during the study

No. of antibiotics prescribed	No. of patients
1	51
2	149
3	61
4	35
5	28
6	3

Antibiotics were prescribed for various indications. However, the majority of indications included fever and respiratory symptoms. Therefore, the most common indications were fever (21.7%), diarrhoea (21.1%), and cold (14%), cough (13.7%), abdominal pain (9.4%) and urinary tract infections (UTIs) (7.6%). Others indications are shown in table 3.

Table No. -3 Indications for which antibiotics are prescribed

INDICATION	No. OF PATIENTS
Fever	71
Diarrhea	69
Cough	46
Cold	45
Abdominal pain	31
Utis	25
Oral mucositis	18
Asthmatic bronchitis	11
Allergy	9
Pneumonia	2

Table No.4 Dosage forms used in the study

DOSAGE FORM	No. OF PATEINTS
Tablets	170
Injections	83
Syrups	44
Capsules	12
Mouthwash	18

78.5% of the antibiotics show adherence with the National List of Essential Medicines (NLEM). 99.9% of antibiotics were most commonly prescribed by their generic name only. Antibiotics had been prescribed by using various dosage forms but most commonly used dosage form were

tablet (51.98%), injections (25.38%) and syrups (13.45%). Other dosage forms which had been used in the study are shown in table 4.

CONCLUSION

In conclusion, a wide spectrum of clinical diagnoses and a variety of drugs were utilized from various drug classes. Overall, scope for improving rational use of antimicrobial agents exists. Antibiotics were prescribed on clinical judgments in majority of the patients rather than taking the specimen of blood or urine for culture. The prescribing pattern of antibiotics was, however, in concordance with the National List of Essential Medicines. The generic brands were prescribed more commonly, which may result in decreased healthcare cost. However, the increased trend of polypharmacy has to be controlled by the use of empirical antibiotic policy. Educational interventions emphasizing rational prescribing, along with a multidirectional effort to create an updated local formulary, and a strict antibiotic prescribing policy can help significantly to overcome these problems and to reduce the extent of resistance to antibiotics.

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