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ANTIBIOTIC UTILISATION PATTERN IN INDOOR PATIENTS OF MEDICINE DEPARTMENT IN A TERTIARY CARE CENTRE IN EASTERN INDIA

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ABSTRACT

This is a cross sectional observational study done to evaluate the current antibiotic utilization pattern amongst the in patients of medicine department in a Teaching Hospital in eastern India. 840 prescriptions obtained from inpatients of Medicine Department during the period of 1st June 2015 to 31st August 2015 were included in the study. Data was collected in pre-designed case record form. Baseline parameters, use of antibiotics (single/combination), their dose, duration and route of administration and the different regimes of antibiotics prescribed were noted. Out of 840 Indoor prescriptions reviewed, 400 (47.6%) were with antibiotics. The mean age of the patients was (47.76 ± 18.49) years of which 454 (54.05%) were male. The average number of drugs per prescription was 3.8 (3192 / 840) of which 63.5% (2026/3192) were written in generic name. Average number of antibiotics per prescription with antibiotic was 1.5. Oral antibiotics used were 142 (23.35%) compared to 466(76.64%) injectable antibiotics i.e. in 1:3 ratio. Azithromycin (22.5%) was the most common oral antibiotic followed by rifaximin (18.3%). Ceftriaxone (40.6%) was the most common injectable antibiotic used followed by Piperacillin- tazobactam combination (14.6%). A total of 15 types of parenteral and 11 types of oral antibiotics were prescribed Single antibiotic was prescribed in 264 (64%) cases; whereas combination of 2 and 3 antibiotics were used in 126 (29.5%) and 10 (6.5%) cases respectively.

KEYWORDS: Utilization pattern, antibiotics, medical audit, prescription.

INTRODUCTION

History of mankind indicates a continual battle between human beings and multitude of micro-organisms that cause infection and disease. The discovery of Penicillin by Alexander Fleming in 1941 was a boon to the world and since then many others have come into use. Thus antibiotics have become an inevitable part of the modern life.

Antimicrobial agent is a chemical substance derived from a biological source or produced synthetically that kills or inhibits the growth of microorganisms. But like radioactive substances which can either be attributed to cure a disease or to make a nuclear weapon, antibiotics can also be either a boon or bane depending on the usage. In his 1945 Nobel Prize lecture, Fleming himself warned of the danger of resistance.

Antibiotic resistance is the most serious threat faced by medical fraternity today that has detrimental impact beyond imagination. It has been observed that overuse and inappropriate use of antibiotics not only leads to inappropriate resource utilization and increased expenditure but also causes development of antibiotic resistance leading to treatment failure.[1,2] The use of antibiotics in India between the years 2005 and 2009 is on high, marked by 40% increase in the sale.[3] The growing concern about overuse of antibiotics has been supported by the motto of WHO on World Health Day 2011 to hinder the spread of antimicrobial resistance. India has also followed suit by implementing "National Policy for Containment of Antimicrobial Resistance in India" in 2011.[4,5]

Drug utilization studies help to set priorities for the rational allocation of health care budget. It can ascertain the role of drugs in society and also helps in monitoring rational use of drugs. Not limiting to the boundaries of analysis and evaluation of the prescription pattern of the clinicians, it facilitates in formulating the desired antibiotic policy. **[6]** From the perspective of developing countries like India, these studies can be useful to utilize antibiotics in a more cost-effective manner.[7] Despite having multi fold advantages, surprisingly there has been a scarcity of studies in our country. So, this study was undertaken for the sake of cost-effective resource allocation and utilisation of drugs and antibiotics in particular in a developing country like India.

AIMS AND OBJECTIVES

To assess the antibiotic utilisation pattern in prescriptions in Bed head Tickets (BHTs) of admitted patients in medicine department of a tertiary care teaching hospital in Eastern India.

MATERIALS AND METHODS

The present study is a unicentric, cross sectional, observational study, in which antibiotic utilisation pattern in indoor patients of medicine department of Kolkata Medical College during the period of 1st June, 2015 to 31st August 2015 were documented. The scanned copy of BHTs was taken. Institutional Ethics Committee permission was duly obtained. WHO/INRUD have provided a list of medicines which should usually be categorized into the group of antibiotics[8] which was followed with the exception of anti infective dermatological and ophthalmological agents which were not observed in this study. Recommended combinations like Amoxicillin /clavulinic acid, Piperacillin/ tazobactam, Cefoperazone/sulbactum were considered as single antibiotic.[8]

Parameters which were assessed for the study were

- age distribution of patients
- average no. of drugs per prescription
- average number of antibiotics per prescription
- total number of prescriptions with antibiotics
- total number of antibiotics prescribed
- oral antibiotics and injectable antibiotics prescribed
- Combination of antibiotics
- Types of antibiotics
- prescriptions in brand and generic name

STASTICAL ANALYSIS

The data was collected in a study specific data record form. The data from the CRF was transcribed into an excel database and results were expressed in numbers and percentages.

RESULTS

Out of 840 Indoor prescriptions reviewed, 400 (47.6%) were with antibiotics. The mean age of the patients was (47.76 ± 18.49) years of which 454 (54.05%) were male. The average number of drugs per prescription was 3.8 (3192 / 840) of which 63.5% (2026/3192) were written in generic name. Average number of antibiotics per prescription with antibiotic was 1.5. Oral antibiotics used were 142 (23.35%) compared to 466(76.64%) injectable antibiotics i.e. in 1:3 ratio. Azithromycin (22.5%) was the most common oral antibiotic followed by

rifaximin (18.3%). Ceftriaxone (40.6%) was the most common injectable antibiotic used followed by Piperacillin- tazobactam combination (14.6%). A total of 15 types of parenteral and 11 types of oral antibiotics were prescribed. Single antibiotic was prescribed in 264 (64%) cases; whereas combination of 2 and 3 antibiotics were used in 126 (29.5%) and 10 (6.5%) cases respectively.

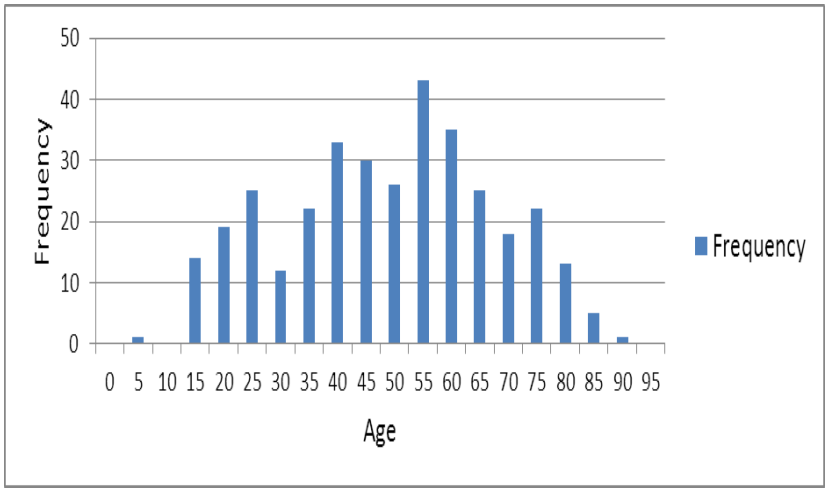

Figure 1: Age distribution of patients

Table 1: **Frequency of injectable antibiotics used**

	Name	Number of injectable antibiotics used (466)
1.	Ceftriaxone	189 (40.6%)
2.	Piperacillin/ tazobactam	68 (14.6%)
3.	Amoxicillin /clavulinic acid	49 (10.5%)
4.	Ciprofloxacin	39 (8.4%)
5.	Azithromycin	28(6%)
6.	Vancomycin	28(6%)
7.	Cefotaxime	15 (3.2%)
8.	Clindamycin	10 (2.2%)
9.	Meropenem	10 (2.2%)
10.	Amikacin	12 (2.6%)
11.	Linezolid	8(1.7%)
12.	Cefoperazone	3 (0.6%)
13.	Cefepime	2 (0.4%)
14.	Cefoperazone/sulbactum	3 (0.6%)
15.	Teicoplanin	2 (0.4%)

Table: 2 Frequency of oral antibiotics used.

	Name of the oral antibiotics	Number of oral antibiotics used (142)
1.	Azithromycin	32 (22.5%)
2.	Rifaximin	26 (18.3%)
3.	Cotrimoxazole	24 (16.9%)
4.	Amoxicillin/clavulinic acid	22 (15.5%)

5.	Cefixime	8 (5.6%)
6.	Ciprofloxacin	6 (4.2 %)
7.	Doxycycline	6 (4.2 %)
8.	Levofloxacin	6 (4.2 %)
9.	Norfloxacin	4 (2.8%)
10.	Ofloxacin	4 (2.8%)
11.	Clindamycin	4 (2.8%)

DISCUSSION

Drug utilization studies help to set priorities for the rational allocation of health care budgets. It is done to assess and quantify the drug use pattern in communities. It can ascertain the role of drugs in society and also helps in monitoring rational use of drugs. Importantly it also provides suggestion about over use, under use or misuse or wastage of single drug compounds or therapeutic classes of drugs.[9] Medication prescribing remains an important component of managing patients and provides useful information in understanding medicine prescribing pattern.

Antibiotics are most extensively used drugs in hospitals. Wide ranges of antibiotics are available to treat various types of infections. Though the choice of antibiotics prescribed depends upon the clinical interest, culture sensitivity, age and gender, their extensive use may lead to the poor therapeutic outcome in terms both health and economic conditions. Various studies have reported that in developing countries 50% of prescribed antibiotic use for bacterial prophylaxis and treatment is unnecessary.[9,10]

The study was undertaken for a period of three months during the rainy season (June to August 2015) but seasonal variations in prescribing can impact on the prescribing indicators for a health facility and the WHO recommends that data for prescribing should be collected over extended periods (ideally one year or more) but this is always not possible.[8] The percentage of males observed was 54.05% while in another study was 58%.[11] Average number of drug per prescription was 3.9, which is quite similar to one study of India where the average number of drug was 4.1[11] 47% (200/420) prescriptions with antibiotics which is much higher than the WHO ideal core prescribing indicator (<30%)[8] as it is done in PHC set up while we included prescriptions from tertiary care Medicine inpatients ward.

In this study, the average number of antibiotic was 1.5 similar to the study organized in central India. [11] In a study from South India, the average number of antibiotic per prescription was 1.83 that was slightly higher than our study.[2] Findings of some other

studies indicate the average number of antibiotic per prescription to be 1.8 and 1.6 respectively.[12,13] The higher use of injectable antibiotics 466(76.64%) was due to the fact that in a tertiary care Medicine inpatients ward, complicated and serious patients are admitted and this would definitely be higher than that of primary health care services. The most commonly used injectable antibiotic was ceftriaxone which was also found in one study. [2] whereas cefotaxime was the main antibiotic used in other studies from India.[11] Azithromycin was the most common oral antibiotic used in our study. In a study from Turkey Amoxicillin-clavulinic acid was the most common antibiotic.[14] Second most common oral antibiotic used was rifaximin that was specifically used in alcoholic patients. Our study depicted that the cost of treatment was considerably lower and affordable to the patients as the most common antibiotics prescribed (ceftriaxone, azithromycin) were supplied from the hospital free of cost.

No. Of drugs written in generic name 63.5% (2026/3192) in this study that was much higher than that observed in the previous study conducted in India **[11].** The percentage was considerably higher (69.2%), in a study from China.**[15]** In 43.83% prescriptions of the study, all the drugs were written in the generic name. This study showed increased awareness among clinicians to prescribe in generic name. Again it is practically impossible to have all medicines prescribed in the generic form as some medicines are still not off-patent. In an area with known proliferation of sub-standard medications, prescribers' confidence in the treatment lies with the prescription of brand medicines.

CONCLUSION

This study reflects the trend of antibiotics prescribed in Inpatients of General Medicine in a Tertiary care teaching hospital. Though the appropriateness of the antibiotics prescribed was not evaluated, the need for introduction of guidelines for prescribing antibiotics and the role of Hospital Antibiotic Policy must be made mandatory with immediate implementation. Prescribers must be encouraged to reduce the empirical use of antibiotics and progress towards definitive therapy. The antimicrobial stewardship programme is a must for every hospital and it should seek to achieve optimal clinical outcomes related to antimicrobial use, minimize toxicity and other adverse events, reduce the costs of health care for infections, and limit the selection for antimicrobial resistant strains.

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