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Research Article

A PROSPECTIVE STUDY ON ANTIMICROBIAL UTILIZATION PATTERN IN OUTPATIENT DEPARTMENT AT TERTIARY CARE HOSPITAL, PUNE, INDIA

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ABSTRACT

Objective: The objective of the study was to evaluate antimicrobial prescription pattern in outpatient departments.

Method: This was a prospective, cross-sectional and observational study over 12 weeks total 400 prescriptions of either gender and age; containing antimicrobial agents (AMAs) were analyzed for demographic data and the WHO prescribing indicators.

Results: Most of prescription were given to men (n=262). The most common group of AMA used was Cephalosporins (n=141, 35.25%); of which Ceftriaxone was most commonly prescribed (n=73, 18.25%). 10 AMAs were from the WHO essential medicine list AMAs. Men outnumbered women in prescribing antibiotics (n=262 vs. 138). Most of AMAs receivers were between 26 and 35 years (n=128, 32%). Amoxicillin+Clavulanic acid fixed-dose combination was most common (n=84, 21%). Most of the prescriptions were containing four drugs per prescriptions (n=130, 32.5%). Only 10% of the prescription was given by generic name and rest 90% were given by brand name. Oral dosage form of AMAs was predominant (n=340, 85%). Vitamins and supplement were most common comedication received by patients.

Conclusion: Antibiotic use was found to be reasonable and rational in most of the cases. However, still, prescribers should improve prescribing practices and make it more rational.

Keywords: Antimicrobials, Prescribing pattern, WHO prescribing indicators, Rational use of drugs, Outdoor patients.

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INTRODUCTION

Drug utilization studies assess the appropriateness of pharmacotherapy with important implications for clinical practice as they provide a clear picture of real world use pattern and allow identifying areas that need change and improvement. It also provides insight into efficacy of drugs [1]. Many drug utilization studies have shown considerable variations in prescribing practices with a high rate of polypharmacy, which is generally used when there is a failure to control symptoms.

For proper antimicrobial agents (AMAs) prescribing, the clinician should try to define the type of infection and the presumable causative microorganism. The points to be evaluated for AMA prescribing are justifications of the prescription, more effective alternatives, less toxic alternatives, less expensive alternatives and drugs with narrower spectrum. That is why clinicians should be evaluated by the ongoing prescription audit. Prospective drug utilization study can have an immediate and direct effect on patient care by detecting problems before a prescription is dispensed [2].

Therefore, the present study was conducted to understand and evaluate the prescription pattern of AMAs at SMT Kashibai Navale Medical College and Hospital, Pune, India.

METHODS

This was a prospective, cross-sectional and observational study over 12 weeks, conducted in clinical Outpatient Departments of SMT Kashibai Navale Medical College and Hospital, Pune, India. Out of 500 prescriptions scrutinized, 400 prescriptions containing AMAs were selected. Prescriptions given to either gender, for any age, and any clinical diagnosis were included. Prescriptions not containing AMAs were excluded. Prescriptions are analyzed using the WHO prescribing indicators, also for fixed-dose combinations (FDCs) used and comedications prescribed.

The protocol for the study was submitted to the Institutional Ethics Committee, and the study was started after approval (Ref.SKNMC/Ethics/App/2016/144). Data were calculated using Microsoft Excel and expressed in percentage.

RESULTS AND OBSERVATIONS

Out of 500 outdoor prescriptions, 400 prescriptions were containing AMAs. Men outnumbered women in prescribing antibiotics (n=262 vs 138) (Fig. 1). Most of AMAs receivers were from age 26 to 35 years (n=128, 32%) followed by 15–25 years (n=82, 20.5%) (Fig. 2). The most common group of AMA used was cephalosporins (n=141, 35.25%); in that ceftriaxone was most commonly prescribed (n=73, 18.25%), followed by penicillins (n=92, 23%); in this amoxicillin (n=76, 19%) was most common. Third most common group was macrolide and azithromycin (n=72, 18%) was most common. Out of 16 different types of AMAs, 10 were from the WHO essential medicine list, but that comprise about 88.5% of all AMAs. FDCs are routinely used here, amoxicillin+clavulanic acid FDC was most common (n=84, 21%). We also tried to find out overall polypharmacy frequency. We found most of the prescriptions were containing four drugs per prescriptions (n=130, 32.5%) and 91 prescriptions were containing three drugs per prescriptions (n=91, 22.75%). Only 10% of the prescription was given by generic name and rest 90% were given by brand name. We also found that oral dosage form of AMAs was predominant (n=340, 85%) (Table 1). Patients also got a different kind of comedications, in those, vitamin and supplement were common (n=275, 68.75%) (Table 2). AMA use was found to be rational in 80% of patients. Most of the prescriptions were containing comedications.

Table 1: Gender wise distribution of parameters

Category	Men	Women	total (%)
Individual Drugs			
Amoxicillin	44	32	44 (11)
Azithromycin	55	17	55 (13.75)
Cefadroxil	0	20	0 (0)
Cefixime	23	16	23 (5.75)
Cefpodoxime	5	0	5 (1.25)
Ceftriaxone	50	23	50 (12.5)
Cefuroxime	4	0	4 (1)
Ciprofloxacin	31	11	31 (7.75)
Clavulanic acid			0 (0)
Clindamycin	5	0	5 (1.25)
Doxycycline	31	4	31 (7.75)
Penicillin G	4	0	4 (1)
Piperacillin	12	0	12 (3)
Nitrofurantoin	4	23	4 (1)
Norfloxacin	2	5	2 (0.5)
Ofloxacin	24	0	24 (6)
FDCs			
Amoxicillin+Clavulanic acid	48	36	84 (21)
Piperacillin+Tazobactam	12	0	12 (3)
Ciprofloxacin+Tinidazole	30	23	53 (13.25)
Number of drugs/prescriptions			
1	4	10	4 (1)
2	48	3	48 (12)
3	65	26	65 (16.25)
4	90	40	90 (22.5)
5	20	13	20 (5)
6	14	13	14 (3.5)
Route of administration			
Oral	340	240	100 (85)
Parenteral	60	35	25 (15)

Table 2: Comedications used with AMAs

Comedications	Number of prescriptions
Vitamins and supplements	275
Pantoprazole	160
Paracetamol	151
Amlodipine	87
Aspirin	76
Propranolol	65
Metformin	60
Cetirizine	55

AMAs: Antimicrobial agents

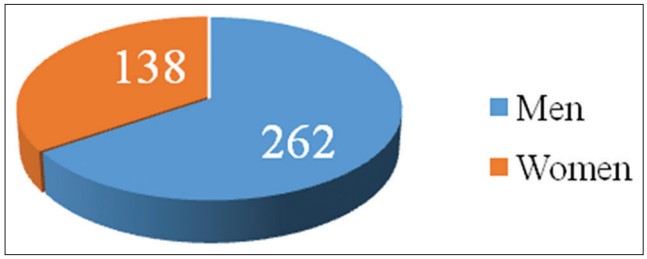

Fig. 1: Total number of prescriptions

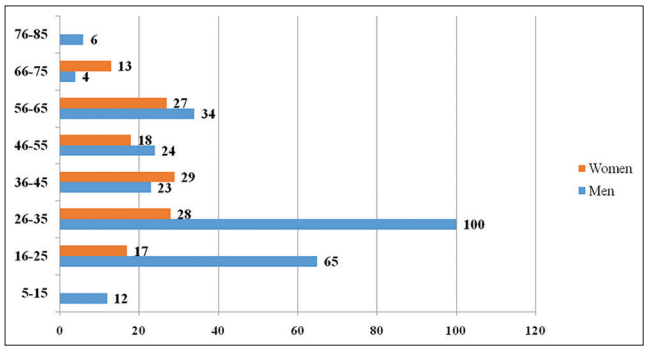

Fig. 2: Number of prescriptions as per age groups. X-axis - number of prescriptions, Y-axis - age groups

DISCUSSION

Drug utilization is a tool to measure ongoing prescription practices. It has a direct impact on patients health care cost and health suffering. Today, antibiotics are one of the most expensive drug expenditure in hospitals accounting for 20%–50% of total pharmacy [**3**]. AMAs are most used and misused drugs by patients and prescribers [4]. The fear of physician whether he is missing any occult infection also makes him to use an antibiotic umbrella for protecting him and his patient. To get breakthrough from the irrational pattern of prescribing behavior of antibiotic, this study is done.

In our study, men received more antimicrobial prescriptions than women. Pallavi *et al*., Randad *et al*., and Gowthami *et al*. found the same result in their study [5-**7**]. Some studies found exactly opposite results [8]. The most common drug group prescribed was Beta-lactam antibiotics; in that most common AMA was ceftriaxone (18.25%). Beta-lactams are commonly used AMA and use abundantly in practice. There are many studies who found same result [4,**7**,9-13].Beta-lactams are well established AMAs regarding their efficacy and safety that may lead to its widespread use. Pallavi *et al*. found broad-spectrum antibiotic was most common in their study [5]. Choice of AMA may differ from doctor to doctor, but ideally one should stick to ideal prescribing according to hospital formulary. Out of 16 AMAs, only 10 were from the WHO essential medicine list. Ramesh A *et al.* found same result [4]. FDCs are routinely used in practice. Amoxicillin plus Clavulanic acid combination was most common (n=84, 21%). This finding is in line with a study conducted by Gedam *et al.*[14]. Most of the patients were between 26 and 35 years age group, most of the prescriptions were for men (n=100). Polypharmacy is a common phenomenon in practice, having a negative impact on patients. In our study, four drugs per prescription were most common pattern we found. This finding was with Randad *et al*. and Pallavi *et al*. [5,6]. 90% of the prescriptions were given by brand names. Such habits lead to specific brand promotions. This finding coincides with Meher *et al*., Beg *et al*., and Pandiamunian *et al*. [12,15,16], 85% of AMAs given by oral route of administration. This is because we included patients from the outpatient department. In studies conducted by Ramesh *et al*., Mahajan *et al*., Beg *et al*., Padiamunian *et al*., and Rasheeduddin *et al*. found opposite result, injectable AMAs were predominant [4,11,12,16,17].

CONCLUSION

This study was purely based on outpatient department patients. Antibiotic use was found to be reasonable and rational in most of the cases. However, still, prescribers should improve prescribing practices make it more rational. There should be a strict check on polypharmacy. Prescribers should be motivated to prescribe from the WHO essential drug list. Prescribers should prescribe the drugs by their generic names. It can reduce prescribing and dispensing errors.

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CONFLICTS OF INTEREST

There is no conflict of interest.

AUTHORS CONTRIBUTION

Dr. Sarang Deshmukh has contributed in the initiation of concept; design this study, literature search, data acquisition, data analysis. Miss Yashashri and Miss Harshita have contributed in statistical analysis and manuscript preparation. Dr. Uma Bhosale has done manuscript editing and review.

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