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Original Article

Assessment of Antibiotic Prescription Practices in a Tertiary Care Hospital

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Abstract

Background: Widespread and irrational use of antibiotics has caused microbials to acquire resistance and is an important public health problem to be urgently addressed. Hence there is a need to constantly monitor the prescription practices through audits and to initiate corrective measures. **Objectives:** To asses the antibiotic prescription practice in a teaching hospital. **Materials and Methods :** The prescriptions originating from medicine out patient department on one day in a week for five months were assessed for appropriateness in dosage, duration of treatment and use of fixed dose combination drugs (FDCs). The clinical diagnosis and patients details were recorded in a structured proforma. **Results:** Out of 650 patient prescription studied 180 patients (27.6%) received antibiotics. Among them 25.3% patients were prescribed one antibiotic and (18.8%) were prescribed antimicrobial FDCs. Out of the 180 prescriptions, 47% were irrational. The most commonly prescribed antibiotic categories were β-lactam antibiotics (35.1%), followed by fluoroquinolones (18.8%) and combinations of antibiotics from different groups (13.8%). **Conclusion:** Higher frequency of irrational antimicrobial prescriptions suggests that antibiotic restriction policies and a multidisciplinary effort to reduce usage are urgently required.

Keywords: prescription practice, antibiotics, FDCs

Introduction

Infective disease are predominant in developing countries and hence the importance of antimicrobials appears magnified.[1] But inappropriate and indiscriminate use of antimicrobials in such situations have led to the emergence of its resistance and treatment failures.[2] Even though the emergence of antimicrobial resistance are global problems, they are inadequately addressed to in the developing countries. It is presumed that the health care providers should use antimicrobials rationally and should nurture good prescription practices. But, irrational use by practitioners of antimicrobial fixed dose drug combinations (FDCs) and inadequate dosages are very well known. This necessitates use of higher antimicrobials and hence an escalation in treatment costs. Globally initiatives are being taken to minimize the problem of antimicrobial resistance through promotion of its rational usage.[3] Hence there is a need to know the current antimicrobial usage pattern to aid in promoting its rational usage.[4,5] This study assesses the use to antimicrobial drugs in a tertiary care hospital.

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Materials and Methods

The prescriptions made in the out patient department (OPD) of medicine was recorded from the reference hospital at Mallapuram district in Kerala. The recording was made on all the Saturdays in the months of March to July 2014. A predesigned structured proforma was used to collect the relevant data. Patient's demographic profile, diagnosis and details of the antimicrobial drugs prescribed namely its

name, strength, dose, route to be taken and deration and frequency were all recorded.

Results

The prescriptions of 650 patients were assessed. Nearly 620 (95.4%) of the patients attending the medical OPD were prescribed with at least one drug. About 234 (36%) of them were prescribed two drugs and 120 (18.4%) with four or more drugs. The average number of drugs written in the prescriptions were 2.5. Around 35% of the prescriptions had analgesics/antipyretics/anti-inflammatory drugs and around 19% had acid lowering

Table 1. Distribution by age and sex of patients visiting medicine OPD

Age (yrs)	Male No.(%)	Female No.(%)	Total No.(%)
16-30	97 (24.4)	63 (25.0)	160 (24.6)
31-45	140 (35.2)	83 (32.9)	223 (33.3)
46-60	99 (24.9)	77 (30.5)	176 (27.0)
> 60	62 (15.5)	29 (11.5)	91 (14.0)
Total	398 (61.2)	252 (38.8)	650

Table 2. Number of antibiotics prescribed per patient

Antibiotics	No. of patients (%)
Single antibiotic	91 (50.5)
Two or more antibiotics	11 (6.1)
>Three antibiotics	14 (7.8)
Antimicrobial FDCs	34 (18.9)
Total	150

Table 3. Distribution of antibiotics by groups, subgroups and ATC codes

Drug group	Subgroup	ATC code	No. of antimicrobial Prescriptions (%)
Tetracyclines	Tetracyclines	J01A	06 (3.3)
Penicillins	Extended spectrum penicillins	J01CA	12 (6.6)
	Combination of penicillins	J01CR	28 (15.6)
Cephalosporins	1st Generation	J01DB	07 (3.9)
	2nd Generation	J01DC	01 (1.0)
	3rd Generation	J01DD	15 (8.3)
Sulfonamide with Trimethoprim	Combination of Sulfonamide with Trimethoprim	J01EE	04 (2.3)
Aminoglycosides	Other Aminoglycosides	J01GB	05 (2.8)
Macrolides	Macrolides	J01FA	11 (6.1)
Quinolones	Fluoroquinolones	J01MA	34 (18.9)
Combination of antibiotics	Combination of antibiotics	J01RA	25 (13.8)
Other antibiotics	Glycopeptide antibacterials	J01XA	03 (1.7)
	Imidazole derivatives	J01XD	08 (4.4)
Agents against amoebiasis and other protozoal diseases	Nitroimidazole derivatives	P01AB	07 (3.9)
	Other agents against amoebiasis and other protozoal diseases	P01AX	09 (5.0)

drugs. None of the prescriptions had any of the banned drug formulations. Of the 620 prescriptions 180 contained antibiotics. Around 91 (50.5%) of these prescriptions had one antibiotic and 34(18.9%) had fixed dose combination antibiotics prescribed. Antibiotics namely penicillins, fluoroquinolones, combinations of antibiotic and cephalosporin's were more frequently prescribed (Tab.3). Upper respiratory tract infection (35%), urinary tract infections (19%) followed by diarrhoea (18%) were the common conditions for which antibiotics were prescribed. Around 56.6% of them were prescribed with antibiotics for 7 to 10 days and 29.7% of them for less than 5 days. The patients were categorized by sex and then divided into four age groups. The frequency of prescription was calculated for each age group and for males and females separately. Prescribing frequency was expressed as a percentage of the prescription of the individual drug/drug class in a particular age/sex category to the total number of patients in the particular age/ sex category.

WHO guidelines were taken into consideration for evaluating the rationality of prescriptions. The parameters for evaluation were: (1) Dose strength and dosage schedule (2) Duration of therapy (3) FDCs: rational/ irrational. The antibiotics were classified using the Anatomical Therapeutic Chemical (ATC) classification system. In the ATC classification system, the drugs are divided into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties.[13]

Discussion

This prescription audit undertaken in the referral hospital found that respiratory infections, urinary infections and diarrhoea were the common clinical conditions for which antibiotics are prescribed. β -lactam antibiotics and fluoroquinolones were commonly prescribed. There is an increased risk of adverse effects and drug interaction with polypharmacy.[6-9] Around 34% of the prescriptions had 3 or more drugs prescribed. Such antibiotic prescription practices observed in this hospital is also reported from studies conducted in other developing countries.[10-16] The dose and duration of prescription of these antibiotics for the common infections were found to be appropriate and is found to be the same in a study conducted at Lucknow.[17]

Fixed does combinations were seen among 34 prescriptions and 23 of them were found to be irrational. Such trends in prescriptions has been observed in other audits.[10,13] Prescription of FDCs could be due to the empirical use of antibiotics clinically and not relying on microbiological cultures and sensitivity reports.[18] Studies also have observed that defensive prescription, demands from patients and their relatives for antibiotics and inadequate knowledge of the proper indications as some of the reasons for irrational antibiotic use.[19-21]

Conclusion

The prescription audit finds a need to reduce the mean numbers of drugs prescribed. There should be a cautious use of fixed drug combinations. Surveillance through prescription audits and continuing medical education should be periodically carried out to improve antibiotic prescription practices.

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