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Evaluation of Prescriptions Quality and Estimation of Antibiotics Prescribing According to Different Classes In Community Pharmacies of Lahore

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ABSTRACT

Irrational prescribing of antibiotics is a major cause of antimicrobial resistance worldwide. Moreover the lack of attention by the physicians to the quality of prescriptions also play a key role in antimicrobial resistance and other problems such as patient medical record keeping, inappropriate dispensing and inadequate counseling by a pharmacist. The main purpose of the study was to evaluate the quality of prescription according to WHO guidelines and finding the antibiotic prescribing habits of physicians. The area of the study was limited to six branches of leading community pharmacy of Lahore. The concurrent method of study was used in the project. It was noted that generic prescribing was 1.7. Strength of drugs were 84.62%, dosage form 92.31%, dose 70.94%, frequency 74.36 %, duration 65.91 %. Basic patient information was the second set of parameters analyzed in the research. It was seen that body weight and address was present in 7.69 % and 5.98 % prescriptions respectively. Diagnosis was present in only 35 % of prescriptions. The study shows that Quinolones are the most prescribed anti-biotics (24.2%). The second most prescribed class was Cephalosporins (19.8 %). Third most prescribed class was Penicillins (13.66 %). Macrolides comprise of 8.07% of total prescribed. Others classes were Tetracyclins and Aminoglycosides (both 3.727%), Lincosamides 3.1%, and Carbapenems 2.4%.

Keywords: Antibiotics, Prescribing, Community Pharmacy

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INTRODUCTION

Improving the Rational Use of Drugs, especially in Developing countries, is a difficult task worldwide. One of the major reasons is that clinical training for undergraduate students often focuses on diagnostic rather than therapeutic skills [1].The decision to prescribe an antibiotic should always be clinically justified and the reason(s) for prescription should be written in PMR.[2]

It is known that the frequent use of antibiotics influences the overall bacterial flora and increase the proportion of resistant bacteria [3] , thus antimicrobial resistance is recognized as a threat to public health. It is widely acknowledged that antibiotic resistance is driven by high rates of antibiotic prescribing[4]. Although there is no particular definition of 'appropriate' therapy, but figuratively speaking, appropriate antimicrobial therapy implies that the indication, choice of drug, timing of administration, route, dosage, frequency and duration of administration have been rigorously determined.[6] Four principal areas should govern the use and management of antimicrobials i-e, necessity; appropriateness; ADR; Antimicrobial Resistance. [7]

Now-a-days the patients admitted to hospitals are aged, in more serious conditions, and more immune compromised than their ancestors so are more predisposed to nosocomial infections requiring frequent antimicrobial therapy. So this increase in antimicrobial prescriptions, leads to increased prescribing errors.[8] According to WHO more than half of all medicines are prescribed, dispensed, or sold improperly, and 50% of patients fail to take them correctly. [9]

It is a fact that knowledge about the use of antibiotics is important, not only because of their cost but also because their misuse may lead to high rate of morbidity and mortality, high hospital infection rates and rapid obsolescence of valuable drugs. [12] Another important parameter that is to be added is physician's complete name, registration number and signature in case of prescription of controlled drug [14]

The aim of the study was to evaluate the quality of prescriptions against Basic Prescribing Parameters and Basic Patient Parameters. The relative percentage of the antibiotics prescribed was also determined in which both the percentage of Antibiotics classes and individual antibiotics were calculated. The Prescribing Core Indicators were evaluated from WHO Guidelines and they were compared with the Reference Ranges of the indicators.

MATERIALS AND METHOD

The study was performed in the leading community pharmacy chain of Lahore city. The primary target of study was the patients coming to community pharmacy. Those included all type of

patients. Concurrent method of study was used in this project. The study was conducted at Fazal Din Pharma Plus retail chain in Lahore city. The study continued for 3 months (August 2013 to October 2013) and as many prescriptions as possible were collected. All the prescriptions, with or without antibiotics were included for counting purposes but the prescription analysis was only done on the ones containing antibiotics in them. Prescriptions containing only para pharmaceuticals were not included. The indicators analyzed were WHO core prescribing indicators [16, 17], Basic Patient Information,[1, 18, 19] Basic Prescribing Information [1, 18, 19] and Percentage of Different Classes of Antibiotics. Descriptive Statistics were applied on the results using SPSS 16.00. Graphs were made by using Microsoft Excel 2007 in addition to the former.

RESULTS AND DISCUSSION

A total of 355 prescriptions were seen. Out of which 117 were containing antibiotics, and further prescription analysis was conducted only on these prescriptions. Firstly, the basic prescribing information was analyzed for every prescription. It was noted that generic prescribing of antibiotics was 1.7%, which was significantly low according to WHO specifications, in which it should be 100% [16]. In contrast to this, in other countries it was 20.6% in Yemen for antibiotics[5] and overall 42.7% in Nigeria [23].

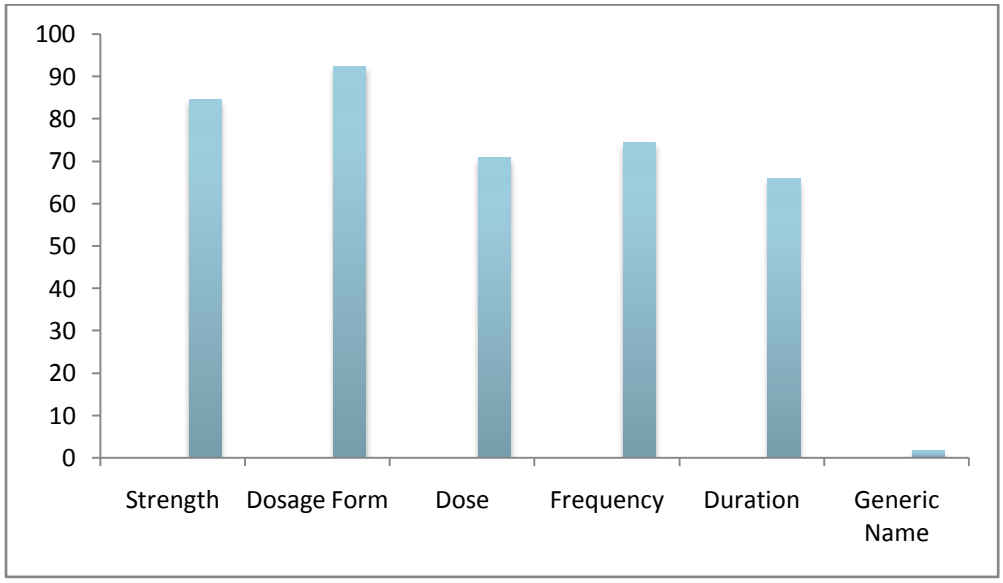

Figure 1 Percentage representation of Basic Prescribing Parameters

A study of Cambodia had shown successful generic prescribing i.e. 99.7% [21]. The brand names were mostly used in our country. Generic prescribing promotes cost-effectiveness and decreases problems like brand duplication, so this parameter should be given attention. The rest of the result was satisfactory with strength 84.62%, dosage form 92.31%, dose 70.94%, frequency 74.36 %, duration 65.91 % (Figure 1)

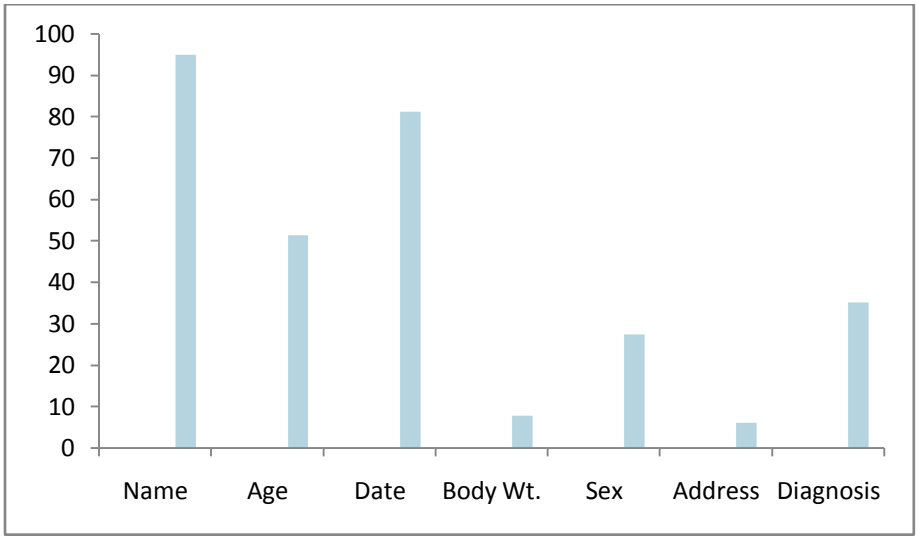

Figure. 2 Percentage representation of Basic Patient Information

According to WHO guidelines the basic patient information should be written on prescriptions. So, the Basic patient information was the second set of parameters analyzed in the study. It was seen that body weight and address were present in 7.69 % and 5.98 % prescriptions respectively, which were very below the mark, as these two are crucial information regarding Dose Calculation and maintaining Patient Medical Record respectively. A study was conducted in Palestine which had only 0% weight [13]. Diagnosis is also basic patient information which was present only in 35% of prescriptions, which made it impossible to check the appropriateness of prescribing. As compared to a study in Yemen, it was present only in 30.4% of prescriptions [5]. Improper diagnosis leads to inappropriate treatment and also increases cost of treatment which further leads to poor health outcomes. Diagnostic facilities should be improved in order to avoid inappropriate treatment and drug resistance issues. The age and gender of patients was also not present in all the prescriptions (51.28 % & 27.35). Only name of the patient was present in highest number of prescriptions 94.87 % and second highest present parameter was date i-e, 81.2% (Figure 2) Details of different branches of chain pharmacies were as follows (Table 1)

The trend of antibiotic prescribing in developed countries is POM, while in most of developing countries it is OTC. The easy access of antibiotics even at grocery shops leads to misuse. Inappropriate, irrational and overuse of antibiotics play a vital role in the emergence of antibiotics resistance.[10] Antibiotics can only be used rationally if they are prescribed according to Standard Treatment Guidelines. The antimicrobial prescribing behavior was also analyzed in the study. Antibiotics were categorized according to different classes with each having its specific percentage (Figure 3)

Table 1 Details of All the Branches of Fazal Din Pharma Plus

	Indicators Analyzed	Shahlamar	Jinnah Hospital	Iqbal Town	Services	Gulberg	Johar Town
		Percentage (%)					
Basic	Name	100	90.91	94.78	90	90.91	100
Patient	Age	52.72	45.45	51.28	60	54.55	50
Information	Date	97.22	72.73	81.2	60	81.82	90
	Body Weight	0	9.091	7.692	20	9.091	10
	Sex	30.56	18.18	27.35	30	27.27	10
	Address	2.78	0	5.983	20	18.18	0
	Diagnosis	22.23	54.55	34.19	40	27.27	50
Basic	Strength	91.67	100	84.62	80	72.73	30
Prescribing	Dosage Form	100	100	92.31	90	72.73	70
Information	Dose	36.11	100	70.94	100	72.73	40
	Frequency	38.89	100	74.36	100	90.91	70
	Duration	38.89	81.82	65.81	80	81.82	90
	Generic name	0	0	0	0	18.18	0

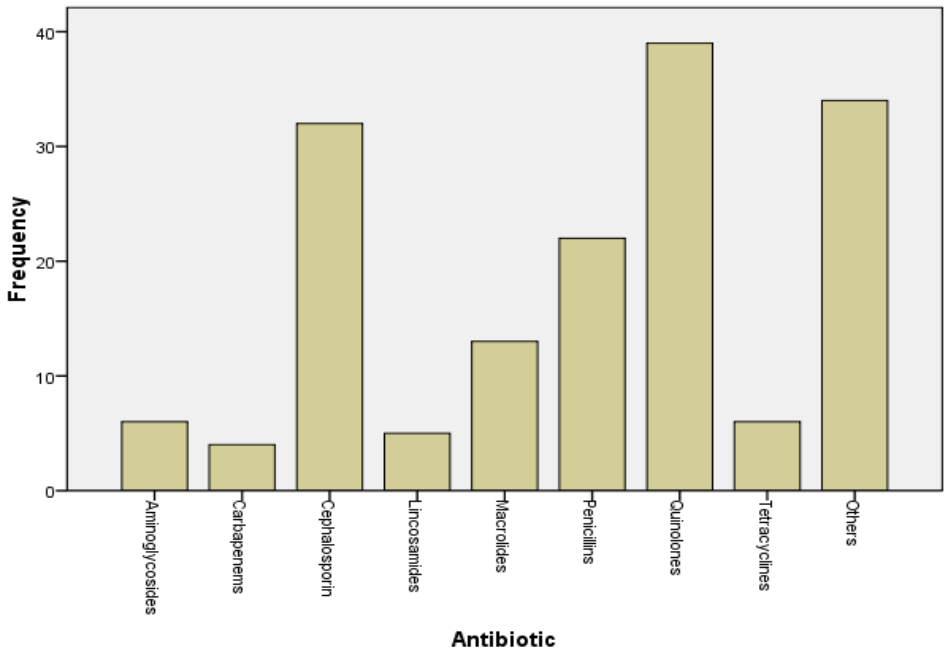

Figure 3 Comparison of Different Classes of Antibiotics

The study showed that Quinolones were the most prescribed anti-biotics (24.2%) with Ciprofloxacin being the most prescribed one (13 %) with levofloxacin (5.6%) and moxifloxacin (3.1 %) being on the top. A study was conducted in Hayatabad medical complex, KPK Pakistan in 2013 in which the prescribing percentage of fluoroquinolones was 3.1%. On the other hand the most prescribed antibiotics in Hayatabad were penicillins (47.36%), which were only 13.6% in our study, placed in third position.[11] A study was also performed in Bangladesh which closely related to our study as the percentage of fluoroquinolones was 26.15%. [22] On the same ground a study was published in Palestine which contained 8.7% fluoroquinolones which was least of

all.[13] Similar study performed in Nigeria in 2009 and the cumulative percentage of fluoroquinolones was 21.5%. The least prescribed antibiotic was choloramphenicol (0.5%) which was totally absent in our study.[23] The second most prescribed class in our study was Cephalosporins (19.8 %); with cefixime being the most prescribed (8.7 %) and ceftriaxone being the second (6.2%). Macrolides comprised of 8.07% of total prescribed antibiotics with clarithromycin and azithromycin being most prescribed (4.9% and 3.1% respectively). Others classes were tetracyclins and aminoglycosides (both 3.727% respectively) and lincosamides 3.1%. In our study, least prescribed class of antibiotic was carbapenems 2.48% which was also the least prescribed antibiotic in a Chinese study but it was considerably less than ours (0.1%).[20] Metronidazole was overall second most prescribed drug and constitutes 11.8% of total antibiotics. Detail of individual antibiotics is given below (Table 2)

Table 2 Details of individual antibiotics

Individual Antibiotic	Individual percentage %
Ciprofloxacin	13.0
Metronidazole	11.8
Co-amoxiclav	10.5
Cefixime	8.7
Ceftriaxone	6.2
Levofloxacin	5.6
Clarithromycin	4.9
Azithromycin	3.1
Doxycyclin	3.1
Moxifloxacin	3.1
Total	70

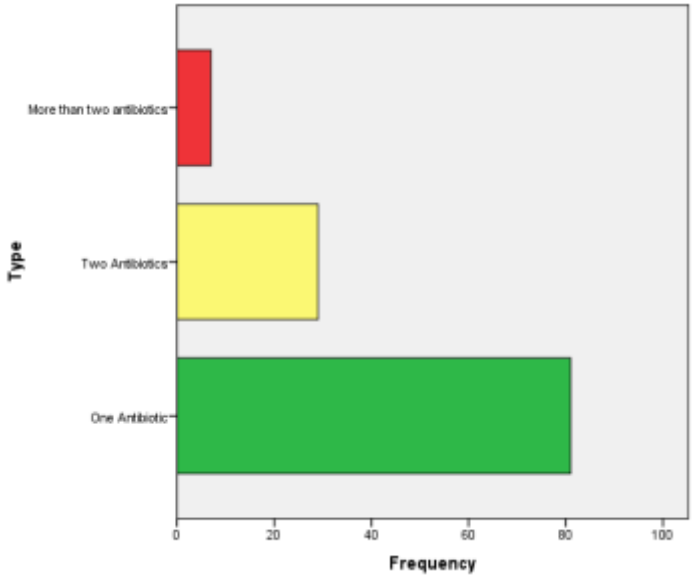

Figure 4 Relative percentage of Antibiotic(s) per prescription

Table 3 WHO Core Prescribing Indicators

Prescribing Indicators	Average/Percentage	Standard Value
Percentage of encounter with Antibiotics	32.96 %	20.0-26.8 %
Percentage of generic prescribing	1.7 %	100 %
Percentage of parenteral encounter	17 %	13.4%-24.1%
Percentage of antibiotics from essential drug list	65.4 %	100 %
Average number of drugs per prescription of antibiotics	4.17	1.6-1.8
Average number of antibiotics per prescription	1.38	NA
Maximum number of antibiotics per prescription	3	NA
Percentage of antibiotics from all drugs	33 %	NA
Percentage of encounters parenteral antibiotics	24.22 %	NA

There was another parameter that was analyzed i.e. number of antibiotics in one prescription. Here we found that maximum number of prescriptions contain only one antibiotic (69.2%), while 24.8% of prescriptions contain two antibiotics and 6% of them contain more than two. (Figure 4) WHO core prescribing indicators were also observed in this study. The percentage encounters with antibiotics was 32.96% which was more than given standard range of WHO (20.0-26.8 %)[16] A study in Bhutan revealed a percentage of 37.1%. [15] In Yemen this percentage of prescriptions encounters with antibiotics was 51% which is also beyond the limits of WHO guidelines.[5] Similarly prescriptions that were collected from Bangladesh indicated that 37.47% of encounter with antibiotics.[22] Use of essential drugs is important according to WHO guidelines and it promises to improve management of drugs along with its cost and by following this we can definitely provide better health care to our community and essential drugs ensure the majority of our population needs. Only 65.4% of antibiotics were being prescribed from essential drug list in Pakistan as results shown by prescribing trends in our study, which was also less than the 100% standardized value of WHO. A similar pattern of research conducted in Yemen showed that 72.5% of antibiotics were prescribed from Yemen Essential Drug List.[5]

The average number of drugs per prescription was found to be 4.17 while the WHO recommended value lies in range of 1.6-1.8 [16] This showed that our value was beyond the recommended value. A study was conducted in Nigeria having values 3.0 ± 1.4 which was also not in range.[23] Maximum number of antibiotics per prescription was found to be 3 which was slightly more as compared to the study conducted in Yemen , this value was 2.8. [5] There were 24.22 % injectable antibiotics being prescribed, while a study in Hayatabad medical complex, Peshawar, indicated greater than 70% of parenteral antibiotics.[11] A similar study depicted 4% and 2.4% of injectable antibiotics being prescribed in Nigeria and Cambodia respectively. [23,21]. In Yemen, injectable antibiotics were prescribed with 36.1 mean value.[5] The only WHO core

indicator that lied within the limit was percentage encounters with parenteral i.e. 17 %, while standard range was 13.4%-24.1%. Some other parameters that were also analyzed are described above (Table 3)

CONCLUSION

After the study we concluded that, patient profile should be given adequate attention. On Physicians's end the main prescribing indicator such as generic prescribing and mentioning the diagnosis on prescriptions should be given special importance. In order to improve the quality of prescriptions the electronic prescription system should be introduce in all health facilities of country. Moreover, to improve the appropriateness of antibiotics prescribing, standard treatment guidelines for all prevailing infections should be followed and the role of pharmacist in designing pharmacotherapy should also be promoted in our community.

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