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Analysis of Prescriptions for Common Paediatric Problems in OPD Practice

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Abstract

Medication errors are one of the most common causes of patient harm and prescribing accounts for a large proportion of medication errors. An observational, retrospective cross sectional study was carried out in the period between May 2013 and July 2013 and collected prescriptions were analyzed statistically using SPSS 13.0 software.

The aim of the study was to identify various patterns of prescription writing by doctors and to detect common errors of prescription.

This study highlights the concerns regarding excessive use of antibiotics , irrational use and combinations of antibiotics with other drugs ,influence of marketing by pharmaceutical companies . Certain measures are suggested to minimize the prescription errors and improvement in the same, thereby enhancing patient safety .

Keywords: Error; Irrational use; Prescription.

Introduction

Recent years have seen a significant shift of focus in healthcare from advances in technology to patient safety; to such an extent, that in 2002, the WHO passed a World Health Assembly Resolution on Patients Safety.[1]

Medication errors are one of the most common causes of patient harm and prescribing accounts for a large proportion of medication errors.

"A prescription is an instruction from a prescriber to a dispenser." There is no global standard for prescriptions and every country has its own regulations. The most important requirements are:

a) The prescription should be legible.

b) It should indicate precisely what should be given.[2]

In May 2007, the World Health Assembly passed resolution 60.20 which called on Member States to improve access to essential medicines for children. The IAP's Essential Medicines List for children (EMLc) of India which reflects the morbidity patterns and other child health needs for the majority of children seeking health care in the country.[3]

It is rare in these days to see a patient with a cold who is not taking a "decongestant" or

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Table 1: Demographic Details of Prescribing Doctors

Name of Doctor (n=129)		*Gender of Doctor (n=129)*			*Qualification of Doctor (n=129)*				*Area of Practice (129)*			*Associated with teaching institute (n=129)*	
Present	**Absent**	**Present**		**Absent**	*Degree (MD/MS)*	*Diploma(DCH)*	*MBBS*	*Not Mentioned*	*Rural*	*Urban*	*Not mentioned*	**Yes**	**No**
		Females	*Males*										
119	**10**	**15**	**104**	**10**	**63**	**41**	**8**	**17**	**35**	**86**	**8**	**18**	**111**

Table 2: Patient Information

	Details		Number (%)
1	**Name of patient (n=129)**	**Present**	121(93.79)
		Absent	8(6.20)
2	**Age of patient (n=129)**	**Present**	77 (59.68)
		Absent	52(40.31)
3	**Weight of patient (n=129)**	**Present**	80 (62.02)
		Absent	49(37.98)

Table 3: Prescription Criteria

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1.
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even an antibiotic. Needless to say, there are no data from well controlled studies to suggest that the use of antibiotics for "prophylaxis" is of any value, and there is no evidence that the use of the multitude of decongestants has anything more than a placebo effect.Antibiotic prescription is a matter of great concern especially in the context of evidence based practice, antibiotic resistance, occurrence of side-effects, delayed diagnosis and preventable hospitalization.[4]

In the absence of an "ideal prescription" for our country, this study was conducted to identify various patterns of prescription writing by doctors and to detect common errors.

Method

*Objectives:*Collected prescriptions were retrospectively analyzed for following:

1. The frequency of errors of omission and commission.
2. Most commonly prescribed drugs for common pediatric problems.
3. The proportion of antibiotic prescription for common pediatric problems.
4. Proportion of prescriptions with legible handwriting.
5. Determining what proportion of drugs prescribed isin accordance with Essential Medicines List (3) for children in India.

Study Design

Observational cross sectional study

Statistical analysis was done by SPSS 13.0 software.

Table 4: Non-antibiotic Drugs Prescribed (n=277)

	Class of drug	No. of drugs	%
1	Analgesics, Antipyretics, Anti inflammatory drugs	52	18.77
2	Anti ulcer drugs (Antacids, H2 antihistamines, PPI)	12	4.33
3	Antispasmodic	13	4.69
4	Anti diarrheal	11	3.97
5	Antiemetic	13	4.69
6	Purgatives	3	1.08
7	Decongestants, Expectorants	23	8.30
8	Anti allergic (Antihistaminic, corticosteroids)	26	9.38
9	Bronchodilators	10	3.61
10	Sedatives	1	0.36
11	Antidepressants	2	0.72
12	Anticonvulsants &Antiepileptics	12	4.33
13	Diuretics	2	0.72
14	Endocrinal	1	0.36
15	Beta blockers	2	0.72
16	Supplements	59	21.30
17	Ayurvedic	7	2.52
18	Miscellaneous	7	2.52
19	Antifungal	5	1.80
20	Antimalarial	5	1.80
21	Antihelminth	11	3.97

Inclusion Criteria

Prescriptions of following doctors were included:

- Pediatricians (Diploma as well as MD) running private OPD outside the institute.
- Pediatricians from Department Of Pediatrics within the institute.
- General Practitioners.

Exclusion criteria

- Those practicing non allopathic medicine.
- More than one prescription from the same doctor.

Methodology

All prescriptions of pediatricians and general physicians carried by patients attending the pediatric outpatients department [OPD] of a tertiary care hospital during the study period between May 2013 and July 2013 were collected with consent of the patient. Prescribing doctors were kept unaware that their prescriptions were being evaluated.

A prevalidatedlegibilityscale was used for testing legibility of prescriptions. All the prescriptions were analyzed by the researcher and a pediatrician.Errors in prescribing were classified into two main types, errors of omission and errors of commission. Errors of omission are defined as prescriptions with essential information missing (name of patient, weight and age, diagnosis, name of doctor, route of administration, dosage and frequency of drug to be used, strength and dosage form, quantity of drug to be bought) and errors of commission are defined as wrongly written information (drug to drug interactions, potentially hazardous drugs written without instructions for monitoring, wrong dosage or

Figure 1: Non Antibiotic Drugs Prescribed

wrong frequency of dosage, wrong duration of therapy).[5]

Results

Of the 129 prescriptions collected, 86 [66.66%] belonged to doctors practicing in urban areaswhile 8 prescriptions did not have any address, though majority of them 119 [92.24%] had the name of the doctor printed and 104 [80.62%] were postgraduates [See Table1].

Errors of Omission

All the prescriptions [100%] collected had errors of omission of some type. Name of patient was present on 121 [93.79%] prescriptions, while other important requirements for a pediatric prescription i.e. age was missing from 52 [40.31%] prescriptions and weight was missing from 49[37.98%] prescriptions.[See table 2]

Majority of prescription 126 [97.67%] were handwritten and 43 [33.32%] could not be deciphered by the researcher, 13 [30.23%] of

Table 5: Antibiotic Drugs Prescribed (n=70)

	Class
1.	Aminoglycos
2.	1st gen Ceph
3.	2nd gen Ceph
4.	3rd gen Ceph
5.	Macrolides
6.	Oxazolidino
7.	Penicillin
8.	Polypeptides
9.	Quinolones
10.	Sulphonami

them were completely illegible and a pediatrician was required to understand 30 [69.76%] of them. Further analysis of prescriptions was done on 116 prescriptions, excluding the completely illegible 13 prescriptions.

Majority of prescriptions, 77 [66.37%] did not have a diagnosis written on it. A high number 41[35.34%] had instructions written in vernacular language, but a pictorial explanation of drug administration and next review date was not mentioned in most 107 &

Figure 2: Antibiotics Prescribed

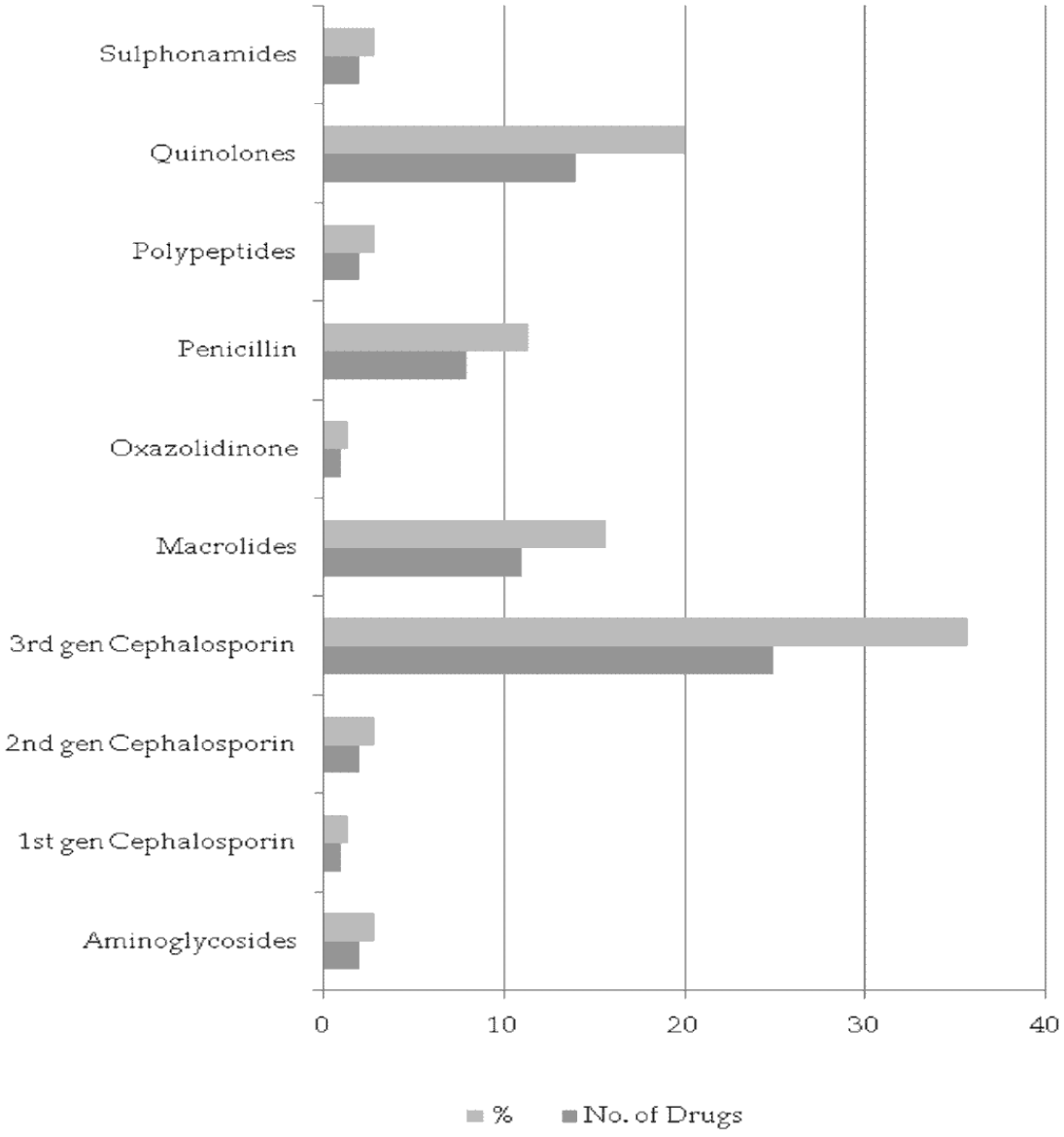


Table 6: Diagnosis for Antibiotics Prescribed

Table 7: Combination Drugs Prescribed

Class	No. of drugs	%
Non Antibiotic Drugs		
Analgesic + antipyretics	1	3.33
Antipyretic + Antihistamine	2	6.66
Antipyretic + opiod	1	3.33
Antipyretic + antispasmodic	1	3.33
Antacid + antispasmodic	1	3.33
Antipyretic + anti-inflammatory	6	20
Antiinflammatory + PPI	1	3.33
Antipyretic + antiemetic	1	3.33
Antipyretic + decongestant	9	30
Antipyretic + expectorant	1	3.33
Decongestant + expectorant	1	3.33
Antibiotic Drugs		
Quinolones + Antihelminthics	5	16.66
Quinolones +Antiamoebics	2	6.66

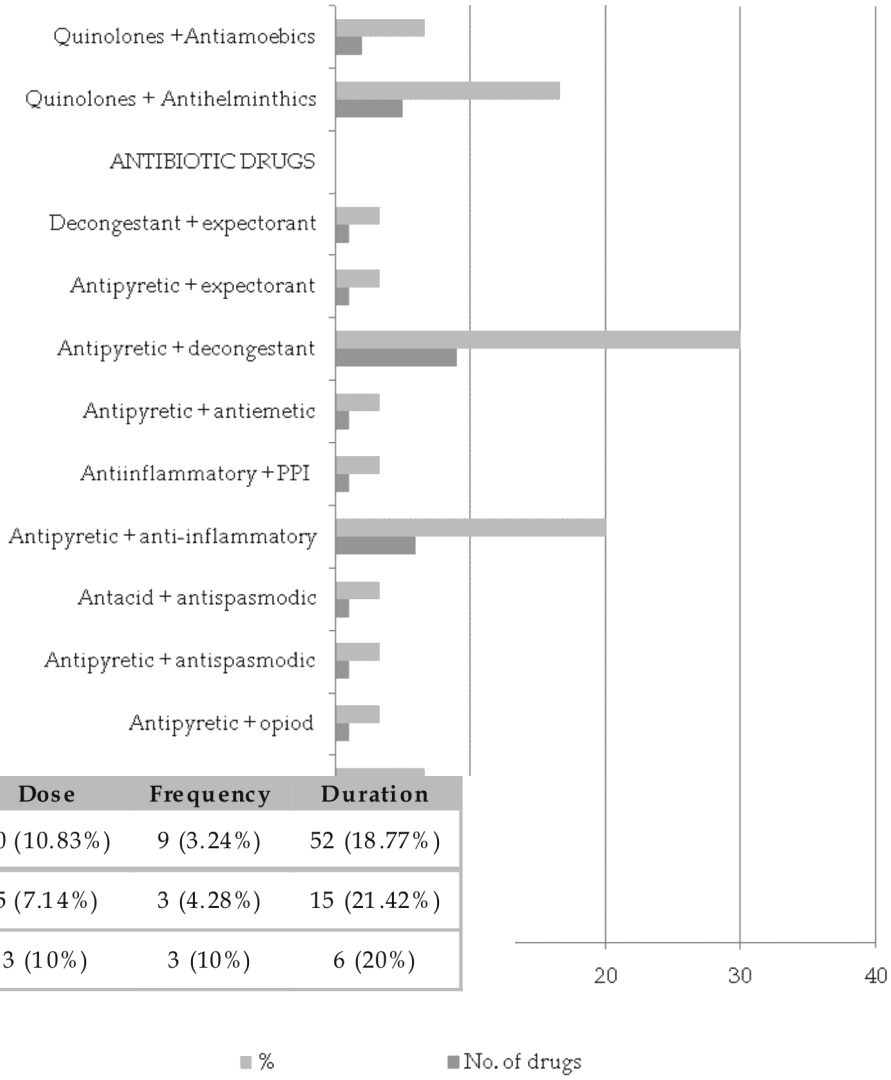
95 [92.24% & 81.89 %] prescriptions respectively [See Table 3].

A total of 377 drugs were prescribed in 116 prescriptions and the overall distribution of drugs is given below.

- Non antibiotic Drugs 277
- Antibiotic Drugs 70
- Combination Drugs
  - o Non antibiotic 6
  - o Antibiotics 24

The prescription frequency of non antibiotic drugs was 277 [73.47%]. The most frequently prescribed class of drugs for pediatric population were supplements [21.30%]

Figure 3: Combination Drugs Prescribed



	Dose	Frequency	Duration
Non antibiotic drugs (n=277)	30 (10.83%)	9 (3.24%)	52 (18.77%)
Antibiotic drugs (n=70)	5 (7.14%)	3 (4.28%)	15 (21.42%)
Combination drugs (n=30)	3 (10%)	3 (10%)	6 (20%)

Table 8: Errors of Omission in Instructions

followed by analgesics, antipyretics, anti-inflammatory[*18.77%].* [See Table 4]

Respiratory system disorders constituted the commonest complaint for which outpatient care was sough 36 [31%]. Out of ….patients with respiratory problems, antibiotics were prescribed in…..number, and the most common antibiotic used were third generation cephalosporins 25 [35.71%] [See Table 6].

Errors of omission were also found with drug prescription, their dose, frequency and duration. The most common error was with respect to duration of drugs 18.7% in the nonantibiotic group and 21.4% in the antibiotic

Figure 4: Errors of Omission in Instructions

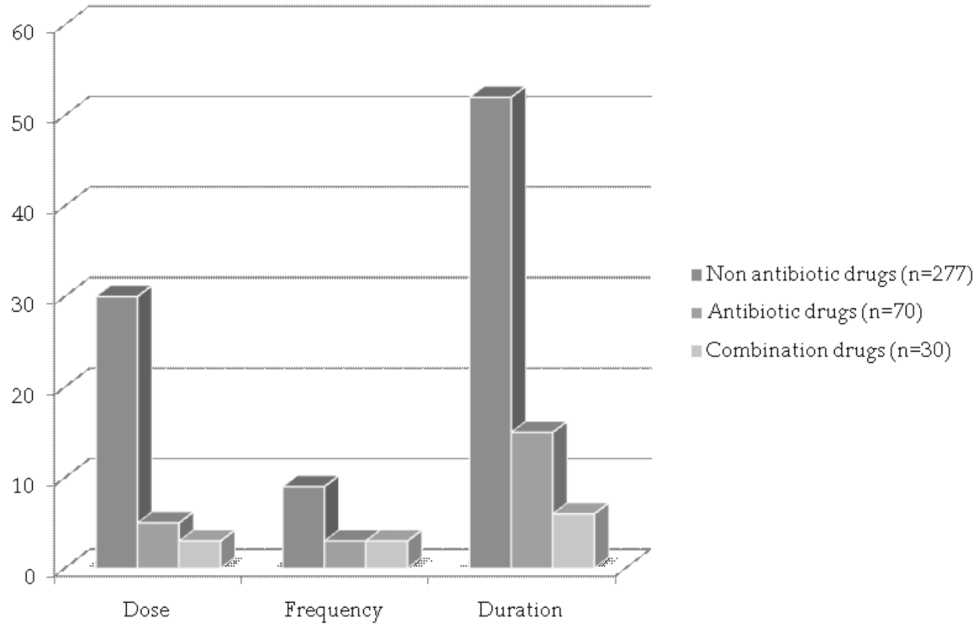


Table 9: Drugs from EML

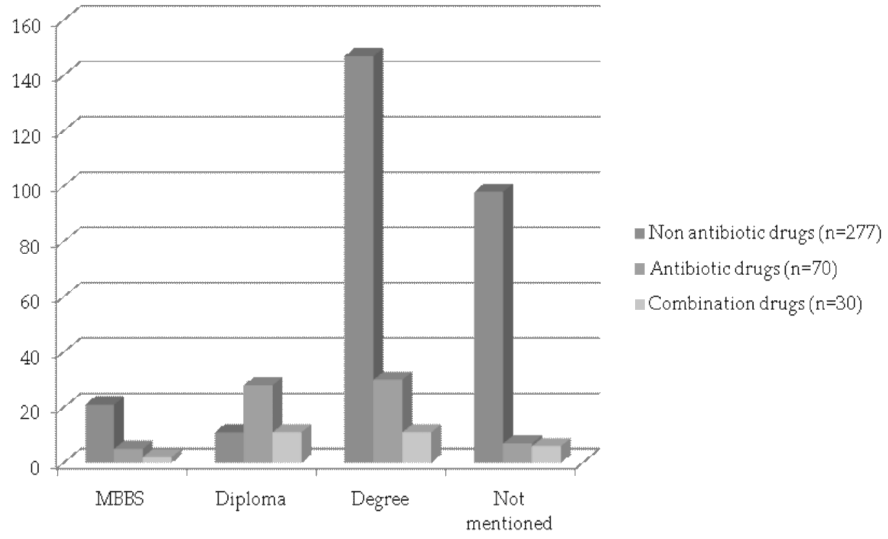
group [Table 8]. No errors of commission were detected amongst the 116 prescription analyzed. There was only one prescription of corticosteroid with no duration mentioned.

The drugs prescribed were compared with the Essential Drugs list compiled by Indian Academy of Pediatrics and there were 137 non antibiotic drugs which were included in the

Figure 5: Drugs from EML

Table 10: Average Percentage of Drugs Prescribed

Figure 6: Drugs Prescribed Vs Qualification



Qualification	Non a drug		
MBBS	21 (7.58)	5 (7.14)	2 (6.66)
Diploma	11 (3.97)	28 (40)	11 (36.66)
Degree	147 (53.06)	30 (42.85)	11 (36.66)
Not mentioned	98 (35.37)	7 (10)	6 (20)

Percent Error Score

Percent error score was obtained for each prescription as an indicator of error based on various essential criteria / features. If particular feature (say *Name of patient*) in a prescription is present, a score 0 was assigned, while if the feature is absent, a score 1 was assigned. This scoring method was used for

eatures like name, age and weight
nt; diagnosis, instructions in
, pictorial explanation, next review
gives a *total basic error score* of 7.
depending on whether the prescription has antibiotics, non-antibiotics or combinations, three essential criteria viz., dose, frequency and duration were examined. The presence of criterion was coded as 0 and absence as 1. Thus, any prescription would have one or more of the above types of medications, which provides a *total medication score* of 3, 6 or 9. Accordingly, the total error score (*basic* and *medication*) for a prescription

Table 11: Descriptive Statistics for Percent Error Score Derived from Prescriptions

Group	Percent error score			
	Mean	SD	Median	Range
MBBS (n=8)	43.98	15.74	43.07	[18.75 - 70.00]
Diploma (n=36)	32.31	12.93	30.77	[7.69 - 69.23]
Degree (n=57)	37.12	14.44	38.46	[0.00 - 75.00]

could be 10, 13 or 16. To normalize, a *percent error score* was derived for each prescription as:

Percent error score = (Score for a prescription / Total possible score for that prescription)*100

Thus, more the score more are the errors committed in the prescription. This percent error score was obtained for each prescription from the three study groups. Table below provides the descriptive statistics for the groups.

It is evident that the mean percent error score for MBBS group was highest (43.98 ± 15.74), followed by degree (37.12 ± 14.44) and then diploma holders (32.31 ± 12.93). In order to determine, if the mean scores across groups differ significantly in statistical sense, *one-way analysis of variance* (ANOVA) was performed on the scores data upon ascertaining the normality of score distribution within the groups. The resulting *P*-value was 0.0703 ($P > 0.05$) indicated that the mean percent error scores across groups do not differ significantly. In other words, there is lack of evidence to support significance of difference of mean scores across these groups; and hence the hypothesis of no difference is accepted.

Discussion

The data presented in this paper serves to highlight the complete lack of any standard pattern in prescription writing as all the prescriptions had some errors of omission. Lack of crucial information like the name or age of the patient on the prescription raises the onus of patient identity on the patient himself. Such a prescription when presented at the pharmacy increases the likelihood of a mix up and administration of wrong medicines. Absence of weight record on the prescription also raises the potential for dosing errors. Our study could not detect dosing errors because more than half of prescriptions did not have weight record. We think that use of prescription formats where spaces for prescription date, patient name & age and diagnosis are emphasized would not only decrease the frequency errors but also simplify the doctor's task. Problems of legibility causing serious and sometimes life threatening errors is a common occurrence.[6] Use of computerized prescriptions is ideal; however an investment in information technology is still a distant dream in the current scenario of healthcare settings with limited resources. Irrational use of antibiotics is already taking its toll on critical care.[7] Excessive use of antibiotic drugs is a worldwide concern because of development of bacterial resistance.[8] Many antibiotic drugs are prescribed for respiratory tract infections even though these infections are known to be predominantly viral.[9] Irrational combination of antibiotics, for example, quinolone & antihelminths is also a matter of concern. Such combinations do not find any place in evidence based practice of medicine and may reflect the influence of persuasive marketing by pharmaceutical companies. The Essential Medicine List compiled by the Indian Academy of pediatrics, National body, reflects the morbidity pattern in India and provides list of medications which should ideally comprise the majority of drugs prescribed in an outpatient care. Majority of drug prescription in our study were not found in the Essential Medicine List of India and this again reflects the unethical influence of marketing agents on practicing doctors. The qualifications of the doctor also reflected on the prescription of antibiotics, the more qualified the doctor; more is the antibiotic prescription, although comparison of the percent of all errors with the extent of qualification did not reveal any statistical significance.

The limitation of the study is that the medical indications that motivated the physician to prescribe the drugs were not known as this information cannot be deduced from a retrospective study. Incomplete data and small sample size also precluded complete analysis for errors of commission.

Conclusion

There are innumerable studies on inadequate prescription writing and innumerable suggestions for improvement in the same, but the scenario reains unchanged. There is a strong need for formal training in prescription writing for doctors, a standard format which should be made compulsory even for a busy practitioner to use and if necessary some kind of legislation against poor quality of prescription.

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