Pattern of prescribing at a paediatric outpatient setting in northern India

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A B S T R A C T

Introduction Drug prescribing is a skill that needs to be refined on a continuing basis. It reflects physician's skills and attitude toward diagnosis of an ailment and selection of appropriate treatment. In view of this, it is important to do study the pattern of prescribing in paediatric patients on continuous basis. The aim of this study was to analyze the prescribing pattern in a paediatric outpatient setting.

Methods: A drug utilization study was carried out in a paediatric outpatient setting in northern India for period of 4 months, on a pilot basis. The study is continuing. The prescriptions of children up to 18 years approaching the clinic were studied and the data was captured from the "Wise-kid" software. The data was analysed to determine WHO recommended prescribing indicators and three complementary indicators for cost.

Results: The data were collected from 436 prescriptions and it was found that upper respiratory tract illness is the most common illness (31%). The average number of drugs prescribed was 3.2±0.06, while drugs prescribed by generic name were 3.8%. Percentage of encounter with injection and antimicrobials prescribed were found to be 0.9% and 18% respectively. The prescribing from National List of Essential Medicine (NLEM-2011) was found to be 39.6%. The median cost of drug per encounter was INR132, while cost spent on injection and antimicrobials were 0.3% and 7%, respectively.

Conclusion: The prescribing pattern in private paediatric outpatient setting were found to be rational as less number of antimicrobial drugs and injections were use in the practice. A very fair number of medicines were prescribed from the National List of Essential medicine (NLEM-2011).

Keywords- Prescribing pattern, Drug utilization, Pediatrics, Out-patients, India

INTRODUCTION

WHO defines rational use of drugs when "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community".[1] The irrational use of drugs is known to lead to an increase in the cost of treatment, incidence of ADR and development of resistance against antimicrobials.[2] Various examples of irrational drug use are poly-pharmacy, inappropriate use of antimicrobials (often in inadequate dosage) for non-bacterial infections; over use of injections when oral formulations would be more appropriate, failure to prescribe in accordance with clinical guidelines, inappropriate self-medication (often of prescription only medicine), and non-adherence to dosing regimens.[1]

There is enough evidence to demonstrate that prescribing of drugs has shifted from generics to branded and prescribing out of NLEM.[3-5] The rational prescribing can be assessed with the help of conducting prescription audit on continuous basis. The results of such studies help policy makers to develop policy regarding quality of rational drug use in a health facility.[6-8] The presence of vast number of brands of the same drug affects the choice of prescribing a medicine.

A meticulous perusal of the literature reveals that paediatric population faces improper use of medicines and subsequent ADR events.[3-5,9] Since paediatric patients are more sensitive toward drugs and ADR. Irrational use of drug can't be tolerated in this age group of population. For that reason drug utilization study on continuous bases must be performed to expose and eliminate such events as much as possible. The prescribing pattern was found with the help of various prescribing and complimentary indicators. The present piece of study was started with the aim to find out the prescribing pattern in a paediatric outpatient setting and is an ongoing study.

METHODS

A drug utilization study was carried out in a paediatric outpatient setting in northern India for a period of 4 months, on a pilot basis. The prescriptions of children up to 18 years approaching to clinic were captured from the "Wise-kid"

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software. The information such as case ID, age, sex, weight, date of consultation, diagnosis, antimicrobial drugs (AMD) and all other drugs prescribed and their doses, dosage form and route of administration, total duration of AMD and other drugs received, total dose of antimicrobials and other drugs administered was recorded in a spreadsheet. Vaccination and other procedures like suturing etc. at the clinic were excluded from the study.

The data so obtained was analyzed for WHO recommended prescribing indicators and three complementary indicators for cost.[10]

1. Average number of drugs prescribed

2. Percentage of drugs prescribed by their generic name

3. Level of adherence in prescribing of drugs from the National List of Essential Medicines (NLEM–2011)[11]

4. Percentage of the prescribed AMD.

5. Percentage of prescriptions with injections.

The determination of cost was performed using the following points:

1. Only the direct cost in terms of Maximum Retail Price (MRP) of drugs in the prescription was calculated. MRP as mentioned in the current issue of the CIMS (Current Index of Medical Specialities) was used.

2. The cost of the prescribed brand was calculated, wherever applicable. In case of drugs prescribed by the generic name, the highest cost was considered.

3. All the estimations for cost were done for the total duration of therapy prescribed.

The cost of drugs per prescription was also computed. In addition, prescriptions were also analysed for morbidity pattern, utilization of different dosage forms, route of administration and antimicrobials. The indicators were represented as average±SEM (Standard error of mean) or percentages, as applicable.

RESULTS

A total of 436 prescriptions were analysed and drug utilization pattern was reviewed with special emphasis on the antimicrobial drugs. The population consisted of 260 male and 176 female patients. The average age of patients was 52.2±2.2 months.

All the patients were divided according to "American Academy of paediatrics" in different age groups (table 1).[12]

| Table 1: Age wise profile of patients	
Age group	Patients
1-12 Months, Infants	98(22%)
1-12 Year, children	305(70%)
13-18 year, adolescents	33(8%) Total 436

The most common diagnosis in the patients was infection of the upper respiratory tract (31%) followed by fever (27%) and acute gastroenteritis (27%).WHO has recommended five

Fig. 1: Profile on the basis of morbidity

URTI- Upper respiratory tract infection
LRTI- Lower respiratory tract infection
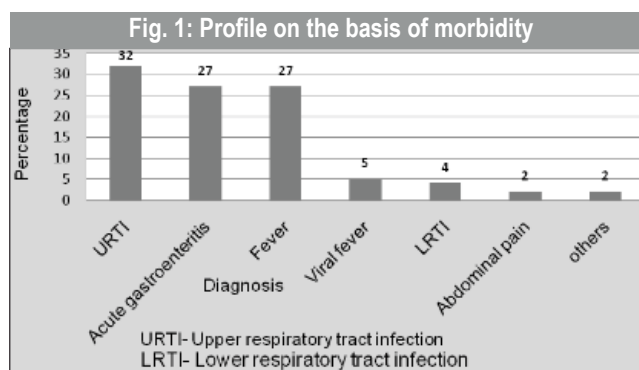
prescribing indicators i.e average number of drug per encounter, medicine prescribed from NLEM, medicine from generics, Injection prescribed, AMD prescribed.

Table 2: WHO recommended Prescribing Indicators	
Indicator	Value
Average number of drugs per encounter	3.2(±0.06)
Percentage of drugs prescribed from NLEM-2011	39.6
Percentage of drugs prescribed by generic name	3.8
Percentage of encounters with an injection prescribed	0.9
Percentage of encounters with an AMD prescribed	18

The average number of drug per encounter was found to be 3.2, with a minimum of 1 and maximum of 8 drugs. The proportion of patients receiving 3 drugs per prescription,4 drugs and two drugs was 34%, 28% &20%, respectively.

Fig .3: Profile of drugs prescribed
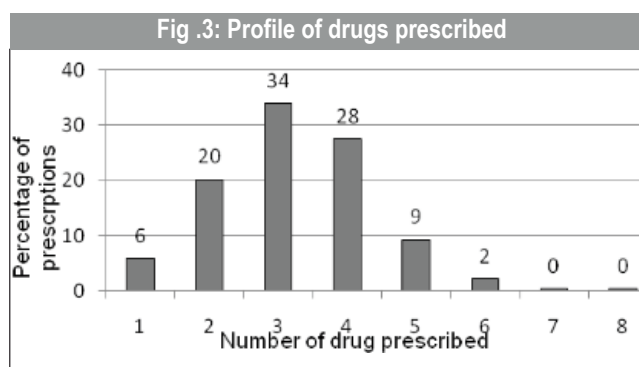
Of the total 1331 drugs prescribed, 527 drugs belonged to the NLEM-2011. Of all the drug prescribed, only 50were prescribed by generic name (3.8%). Only 79 drugs, of 1331, were antimicrobials (6%). The rank order of prescribed antimicrobials was cephalosporin (33%) > penicillin (20%) > macrolide (14%) = fluoroquinolones (14%). The other antimicrobials were antifungals, aminoglycosides and chloramphenicol

Table 3: Pattern of antimicrobial prescribing

| Antimicrobial classes	Number
Cephalosporin	26(33%)
Penicillin	16(20%)
Macrolide	11(14%)
Fluoroquinolones	11(14%)
Antifungal	9(11%)
Aminoglycosides	5(6%)
Chloramphenicol	2(3%)

This study also focused on the complimentary Indicators. The cost of drugs was calculated from the CIMS online portal and from the label of drug at the pharmacy. The various complimentary indicators are shown in table 4.

Table 4: Complimentary Indicators

Indicator	Cost (in INR)
Average cost of drug per encounter	210.4±10.6
Median Cost	132
Cost spent on AMD (% of total)	6123 (7%) C
ost spent on Injection (% of total)	228(0.3%)

Average cost of prescribed drugs was found to be INR 210. Nearly 7% of the cost spent on the antimicrobials costing 6123INR.Out of the total drug prescribed, 90% were administered by oral route, followed by topical (7%) and inhalation (3%).Over 75% of the prescribed dosage forms were syrups followed by the sachets(10%), tablets(7.2%), drops(2.8%), inhalation(1.6%), creams (1.5%), capsules(0.4%) and nasal drops(0.6%;fig 3)

Fig .3: Use of dosage forms
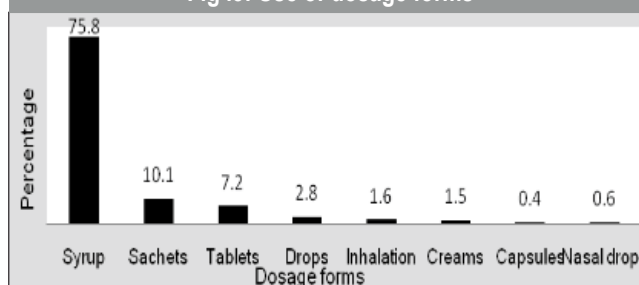
DISCUSSION

The results of the present study are based on the data obtained from 436 patients. The male to female ratio reflected a higher number of male patients who were visiting the clinic compared to female patients. One probable reason for this may be the skewed gender profile in northern part of India.[13]

Upper respiratory tract infection (31%) was the most common infection followed by the fever and acute gastroenteritis. Reactive airway diseases were more common among the children which may be due to cold weather during the period of study. The finding of the present study is in concurrence with the results of Mohanty et al, where the upper respiratory tract infection (39%) were shown to be the most common infection.[14]

The average number of drug prescribed increased with increase in number of diagnosis. In this study the average number of drugs prescribed was 3.2. The rational use of drugs demands that the number of drugs prescribed is as small as possible not only to reduce the cost of treatment but also reduce the chances of drug interaction and adverse effects. The results of studies in paediatric outpatient setting by Dimri et. al..and.Mohajer et. al. have reported the average number of drugs prescribed to be 2.31 and 2.81, respectively.[15,16]

In the present study, only 3.9% of the medicines were prescribed by generic names. Other studies conducted by Mohanty et. al. in southern India found this as 1.42% and Dimri et. al. in Chandigarh reported this as 5.8%.[14,15] The results of Dimri and co-workers are based on patient data from public hospital. However, this study has been conducted in a private setting and this may have an influence on the prescribing by generic names. The possible reasons for less prescribing by generic drugs could be prescribers' doubt about the bioavailability and efficacy of generic formulations, prescribers' ignorance about the price variations between generic and branded and the lack of information on the availability of various generic formulations. Another possible reason could be that the branded drugs are easily available, names are easy to recall for the prescriber and dispenser.

Additionally, the pharmaceutical companies thrive upon the advantage a brand name offers to the business.

A very fair number of drugs were prescribed from the National List of Essential Medicine-2011 (39.6%). There seems to be a scope to improve this indicator. Prescribing from the NLEM in various studies conducted all over India were Dimri et. al., Mohanty et. al., Adebyo et. al., Bharty et. al. were to the tune of 68%, 45%, 6.4% & 58%, respectively. The prescribing from the NLEM should be promoted for optimal use of financial resources and to satisfy the health care needs of the majority of the population safely.[14,15,17,18]

The parental dosage forms are expensive and cause pain due to the prick. WHO recommends lesser use of injection as it helpful in reducing the cost of treatment and eliminate the pain to patient. There are certain factors which lead to increase in injection usage drug available in injection form only and some patients who think that injection could treat their illness faster compare to oral medicine. In present study only 0.9% injection were used. It is found comparable with studies conducted by Dimri et. al., Kumari et. al. (1.18%, 1.17% respectively).[15,19]

Overprescribing with antibiotics increased with overestimation of illness by physicians. Parents intend to see rapid symptomatic relief of disease and often put pressure on the prescriber to prescribe a "strong medicine" i.e. an antibiotic for relief. The overuse of antibiotic is known to cause drug resistance, increased side effects and make the treatment expensive. In this study, only 18% of antimicrobial drugs were prescribed. Other results have reported between 18.5-29% of antimicrobial drugs being prescribed.[15,16] On comparison with results available in literature, it was found that the antimicrobial use in the present study was rational.

To 34% of the patients, three drugs were prescribed. This has to be viewed with the fact that the most common diagnosis was URTI. For treatment of URTI, an analgesic, cough syrups, saline drops were prescribed with or without antibiotics. This is comparable with the results of Kshirsagar et al. in which two and three drugs were prescribed to 37 and 32% of patients, respectively.[20]

Cephalosporin and Penicillin were found to be the most commonly prescribed antibiotic (33%, 20% respectively). Acute respiratory tract infections were found to be most commonly infection and the appropriate antibiotic for treating are Penicillin, Cephalosporin and Macrolide. The findings of study conducted by Khaled et al. has shown that Penicillin prescribed maximum number of time (52%) followed by cephalosporin (32%).[16]

In this study, the median cost of drugs per encounter was found to be INR132. The prescribing of antimicrobials and the injections was rational in this study, and therefore the cost of the prescription is not very high. The cost of prescription increased as the number of injection and antimicrobial drug prescribed increased. It indicates that the prescribing of antimicrobial drugs and injections determine the cost of prescription.

The most commonly used dosage form was syrup. Children are comfortable with the dosage form like syrups and drops compared to tablets and capsules and this finding is well taken. Younger children find tablets and capsules difficult to swallow and the taste is also an issue for compliance. The administration of liquids can be a major contributing error in dosing in the children. The use of different size of spoons may lead to underdosing and overdosing of medication.[21] As syrup were found to be maximally prescribed, therefore it is advised to use graduated caps for accurate measurement of syrup.

The results of this study have provided strong evidence for the rational use of antibiotics. This is an encouraging finding, especially when the prescribers and the policy makers are concerned about issues like antimicrobial resistance and NDM-1.

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