

Drug prescribing and dispensing pattern in pediatrics outpatient clinic of a rural tertiary-care teaching hospital

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ABSTRACT


Background: Children constitute 40% of India's population. They tend to suffer more frequently from illnesses, when compared with adults and elderly. Most of these illnesses are self-limiting. There are reports that these illnesses are treated inappropriately leading to polypharmacy. Children are more vulnerable to the various adverse events related to the use of drugs. Though many studies have been carried out to evaluate the drug prescribing pattern in adult patients, but similar studies in paediatric population are limited. **Aims and Objective:** To evaluate the pattern of drug prescribing and dispensing in pediatric outpatient clinic in a rural tertiary-care teaching hospital using WHO Core drug use indicators. **Materials and Methods:** A cross-sectional study was carried out in the pediatric outpatient clinic of Swami Ramanand Teerth Rural (SRTR) Medical College, Ambajogai, Maharashtra, India. Data were collected by scrutinizing the prescriptions written by the treating physician in pediatric outpatient clinic, using WHO core drug use indicators and by interviewing parents of 300 children attending outpatient clinic. **Result:** The average number of drugs per prescription was 3.4 and actually dispensed was 2.5. There was a high trend of using brand names (49.6% of prescriptions) while prescribing than generic names. Use of antibiotics (60.6% of prescriptions) was frequent, but injection use (0.8% of prescriptions) was very low. A high number of drugs prescribed (77.5%) conformed to WHO list of essential medicines for children and were dispensed (69%) by the hospital pharmacy. The parents' understanding of the correct usage of drugs was low (59%), and only 10.5% of drugs were adequately labeled. The copy of an essential drugs list was not available. The availability of essential drugs was 75%. **Conclusion:** This study highlights the problem of overprescribing of antibiotics, inadequate labeling, and a trend toward polypharmacy. The prescribing from WHO list of essential medicines for children was fair; the use of injections was low. Interventions to rectify overprescription of antibiotics, use of brand names, and inadequate labeling of drugs is necessary to improve rational drug use.

KEY WORDS: Prescription Pattern; Pediatrics; Outpatient Clinic; Rational Drug Use

INTRODUCTION

WHO defines the 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] Rational drug prescribing has been shown to reduce the cost of treatment and adverse drug reactions (ADRs).^[2] Despite advances in the control of drug regulation and availability of drugs, the irrational drug prescribing is still a worldwide concern. Prescription pattern reflects health professional attitude toward the disease and role of drugs in its treatment. The study of prescription pattern is important to monitor prescribing practices to make medical care rational and cost effective. Appropriate drug utilization studies are needed for evaluating proper utilization of drugs for efficacy, safety, convenience, and economic aspects.^[3] WHO has

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formulated a set of core drug use indicators to assess the scope of improvement for rational drug prescribing in outpatient department. These are highly standardized, do not need national adaptations, and are recommended for inclusion in any drug utilization studies.^[4]

Children constitute 40% of India's population.^[5] They tend to suffer more frequently from illnesses when compared with adults and elderly people. Most of these illnesses are self-limiting.^[6] There are reports that these illnesses are treated inappropriately leading to polypharmacy.^[7] Children are more vulnerable to the various adverse events related to the use of drugs. Market is flooded with a large number of pharmaceutical preparations with innumerable trade names available often at unaffordable price. Evaluation of drug utilization in adults and elderly people is a highly visible topic, but similar studies in children are limited. Therefore, there is a scarcity of the data regarding drug utilization pattern in pediatrics.

Keeping these facts in consideration, this study has been planned to evaluate the drug prescribing pattern in pediatrics outpatient clinic using WHO core drug use indicators in our setup with an ultimate aim to achieve rational and cost-effective medical care.

MATERIALS AND METHODS

This prospective cross-sectional study was carried out at pediatric outpatient department of Swami Ramanand Teerth Rural Government Medical College and Hospital, Ambajogai, Maharashtra, India, for a period of 4 months between September and December 2012. The study was carried out with prior approval from Institutional Ethics Committee of our institute. The prescriptions of the children up to 12 years of age written by physicians were included in the study. The prescriptions written by physicians were collected and copies of the original prescriptions used for data collection.

The data were collected using special data collection form, which included patient's demographic profile, drug details, and parents understanding of their drug use indicator. The patients who were not willing to participate in the study and those children who came for immunization were excluded from study.

Total number of 300 prescriptions was collected during the specified period. The data obtained from 300 prescriptions were analyzed for WHO core drug prescribing indicators listed in Table 1. The WHO list of essential medicines for children was used to classify drug as essential. The drug is considered adequately labeled if it contains at least the name of patient, drug name, and when the drug should be taken.

The indicators were calculated as average \pm standard error of mean (SEM) or percentage, as applicable.

The knowledge of drug usage was assessed by interviewing the parents of 300 children attending the outpatient clinic. To measure the understanding of drug use, a semi-scientific grading scale developed by Dinesh et al.^[8] was used to assess whether parents understood the instructions given at the end of consultation. Following six parameters were measured for adequacy and nonadequacy: indication, dose, duration,

Table 1: List of WHO core drug use indicators used in this study

1	Average number of drugs per encounter
2	Percentage of drugs prescribed by generic names
3	Percentage of encounters with antibiotics prescribed
4	Percentage of encounters with injections prescribed
5	Percentage of drugs prescribed from essential drug list or formulary
6	Percentage of drugs actually dispensed
7	Percentage of drugs adequately labeled
8	Patient's knowledge of correct dosage

Table 2: Categorizing parent's understanding of drug use

Total score	Category
> 3	Well understood
3	Moderately understood
< 3	Poorly understood

Table 3: Age- and sex-wise distribution of the patients

Parameters	No. of patients	Percentage
Age		
≤ 1 month (neonate)	35	11.67
> 1 month-≤ 1 year (infant)	88	29.33
> 1 year-≤ 6 years (children)	110	36.67
> 6 years-≤ 12 years (children)	67	22.33
Sex		
Male	132	44
Female	168	56

frequency, to be taken with or after the food, and awareness of side effect. The score of one is given for the adequacy of understanding of each parameter and score of zero for inadequacy. Thus, the maximum total score could be six and minimum score zero for each parent. After assigning a score to each parameter, sum of the scores obtained by the patients was considered for parents understanding of drug use. The scores were categorized as shown in Table 2.

RESULT

Totally, 300 prescriptions were collected and analyzed. Of the 300 patients, 44% were male subjects and 56% were female subjects with age ranging from 15 days to 12 years. The demographic distribution is shown in Table 3.

Totally, 1,020 drugs were prescribed to 300 patients. The average number of drugs prescribed per encounter was found to be 3.4, with a range of minimum one drug to maximum seven drugs. The proportions of patients receiving two drugs, three drugs, and four drugs were 24%, 32.33%, and 26%, respectively [Table 4].

Table 4: Number of drugs per prescription

Drugs/patients	No. of prescriptions	Total no. of drugs prescribed	Percentage
1	05	05	1.67
2	72	144	24.00
3	97	291	32.33
4	78	312	26.00
5	28	140	9.33
6	12	72	4.00
7	08	56	2.67
Total	300	1020	100
Range	1-7		
Average no. of drugs	3.40		

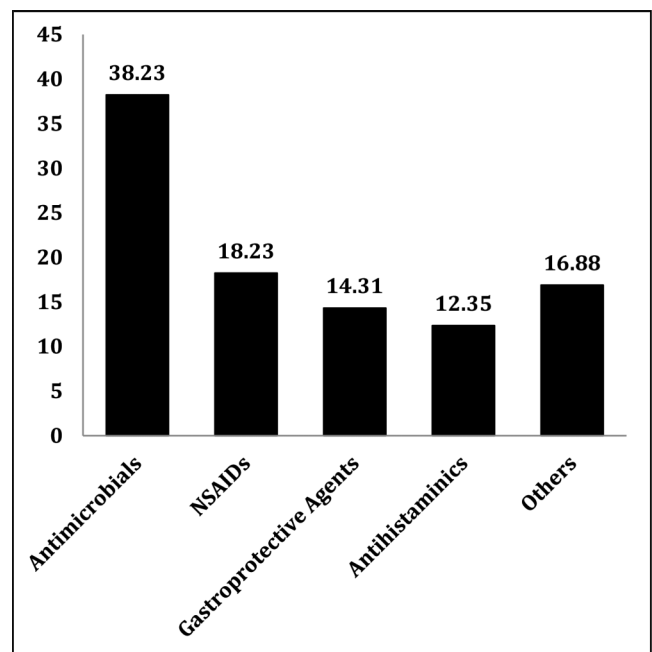


Figure 1: Most commonly prescribed classes of drugs.

Of the 1,020 drugs prescribed, 750 drugs were actually dispensed. Thus, nearly 69% of the drugs were actually dispensed. The average actual number of drugs dispensed comes out to be 2.5 per encounter.

In category-wise drugs distribution, antimicrobials were the most commonly prescribed category drugs followed by nonsteroidal anti-inflammatory drugs (NSAIDs). Of the total drugs (1020), 38.23% drugs were antimicrobials, 18.23% NSAIDs, and 14.21% gastroprotective agents (H₂ blockers and antacids) [Figure 1].

Of the 300 prescriptions, 182 (60.6%) prescriptions contained one or more antimicrobial agents. The average number of antimicrobial comes out to be 1.3. The numbers of prescriptions containing one, two, and three antimicrobials were 44, 77, and 52, respectively [Table 5].

Table 5: Number of antimicrobials per prescription

Antimicrobial/patient	Total no. of prescriptions	Percentage	No. of antimicrobials
1	44	14.66	44
2	77	22.66	154
3	52	17.33	156
4	9	3.00	36
Total	182	60.6	390

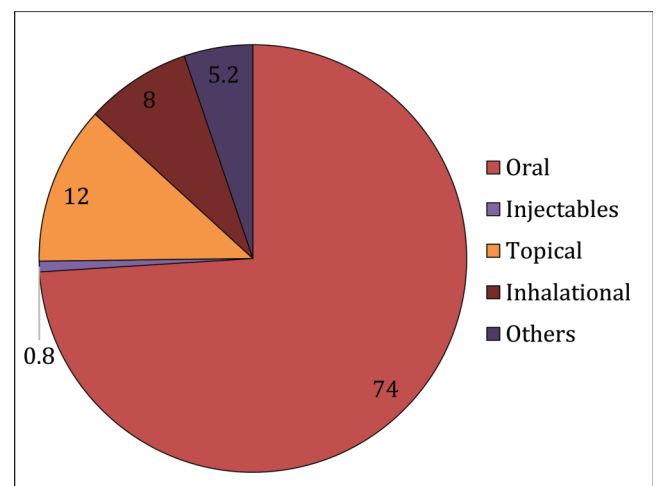


Figure 2: Routes of drug administration.

The most common route of drug administration was found to be oral (74%), followed by topical (12%). The injectable drugs were prescribed only in 0.8% of total encounters [Figure 2].

A fair amount of drugs, that is, 790 of 1,020 (77.5%), were prescribed from essential medicine drug list. Only 50.4% of drugs were prescribed by their generic names. Only 10.5% of the drugs were adequately labeled. The copy of essential drug list was not available, and the availability of essential drugs was 75%.

In this study, parents' understanding of drug usage was assessed by interviewing the parents of the children attending the outpatient department. It is found that only 19% of the parents possessed a well understanding of the drug usage; 40% of the parents belonged to understood category, while 41% of the parents had a poor understanding of the drug usage [Table 6].

DISCUSSION

The focus of this study was to review the prescriptions for rational drug prescribing. The ultimate aim of the study was to make the health-care system more rational and cost effective so

Table 6: Parent's understanding of drug use

Parent's understanding	Percentage
Well understood	19
Understood	40
Poorly understood	41

that it can be beneficial to society. This study demonstrated many lacunas in prescribing pattern.

The numbers of drugs prescribed per prescription (3.4) were slightly higher than those previously reported by Dinesh et al.^[8] and Pandey et al.^[9] The WHO prescribing standards recommends a limit of 2.0 drugs per prescription.^[8] This indicates a trend toward polypharmacy. Polypharmacy can unnecessarily increase the cost of treatment and put an additional burden on already exhausted health-care system. Polypharmacy has been reported to be the one of the causes of ADRs in children, which can further add to the cost of therapy.^[10] In this study, 74.33% of prescriptions contained three or more drugs, which can increase the chances of drug-drug interactions and dispensing errors.

The use of antibiotics in this study was found to be frequent (60.6% of encounters), which is in accordance with the study conducted by Pandey et al.^[9] Other studies carried out have reported variable rates of reporting, from 39.6% to 82%.^[11,12] Antibiotics are one of the groups of drugs most commonly involved in ADRs^[13] and often found to be overused. Inappropriate use of antibiotic leads to increase in antibiotic resistance and may increase the cost of treatment. The strict adherence to antibiotic policy and increase in awareness could be useful to tackle this problem.

In this study, the rate of drug prescription by generic name was found to be 50.4%. Various other studies reported variable rates from 7.4% to 96%.^[9,12] Another study in India has reported a rate of 73.4%.^[11] The prescribing by generic names is known to reduce medication error and decrease the cost of therapy. Despite these advantages, many times, physicians prefer to prescribe by brand name. This may be because of lack of confidence on the quality of generic drugs. Strict quality control on generic drugs should be maintained so as to increase the prescribing by generic drugs.

The drugs that are prescribed should be adequately labeled so as to avoid medication errors. Unfortunately, only 10.5% of the drugs were adequately labeled. Karande et al.^[11] in 2005 has reported similar rate of labeling. This may be because of overburden of patients and the pharmacists hardly find any time to interact with patients. Interventions are needed to rectify this problem.

The injectable doses forms of drugs are generally more costly than oral. If used irrationally, it may unnecessarily increase the cost of the treatment. The injection utilization in this study is low (0.8%), which is in accordance with the study carried by Rehan and Lal.^[14] This may be attributed to a better knowledge of physicians regarding risks of injections.

In this study, only 59% of the parents of the children possessed knowledge of drug use prescribed to their children.

This is low when compared with the other study carried out by Karande et al.,^[11] who have found knowledge about 80.8%. This may be because most of the patients visiting to our institute are from rural setup and the rate of literacy is low. Educational interventions could help to reduce the knowledge gap in parents understanding of drug use.

In our institute, 69.0% of the drugs were actually dispensed, which is higher than previously reported studies^[15-17] but in accordance with study carried out by Karande et al.^[11] The physicians do not have a copy of essential drug list. However, 77.5% of the drugs were prescribed from essential drug list. The prescription from essential drug list should be promoted for optimal use of financial resources. The availability of the essential drugs should be maintained. The availability of essential drugs in our institute was found to be 75.0%. A similar high figure was reported by Karande et al.^[11]

Although it is difficult to curtail the irrational drug prescribing practices, interventions in the forms of rational drug use workshop and problem-based training course in pharmacotherapy may prove useful in improving irrational drug prescribing practices.^[9,18]

CONCLUSION

This study provides the baseline data regarding prescribing practices in pediatrics outpatient department. It also highlights the problem of overprescribing of antibiotics, inadequate labeling, and a trend toward polypharmacy. The prescribing from WHO list of essential medicines for children was fair, and the use of injections was low. There is a scope for improvement in the case of medicines prescribed by generic name. Interventions to rectify overprescription of antibiotics and inadequate labeling of drugs are necessary to improve rational drug use.

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