

EVALUATION OF PRESCRIPTION PATTERN AND DRUG DISPENSING FROM A PEDIATRIC OUTPATIENT DEPARTMENT OF A TERTIARY CARE HOSPITAL

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ABSTRACT

The present study was planned with the aim of identifying scope of improvement in rational drug use in outpatient practice in the pediatrics in a growing medical college from western Uttar Pradesh. We audited 3202 individual drugs on 1186 prescriptions of Pediatrics OPD during Feb 2013- Jan 2014 using "Core drug use indicators" formulated by World Health Organization. A trained person conducted the interviews just after the parents came out of the OPD room. The data for the "prescribing indicators" was recorded by scrutinizing the prescription immediately after the patient-doctor interaction. 3202 individual drugs were prescribed on 1186 prescriptions during the study period. Average number of drugs per encounter was 2.8. Almost 70% of the prescriptions contained two or three drugs per prescription. Maximum number of drugs (7 and 8) were prescribed to only 4 (0.34%) patients. Prescriptions in trade names (88.12%) dominated prescriptions in generic names (11.88%). Most drugs (79.43%) were not adequately labeled as the name of the patient and the generic name of the drug were not written. Similarly, only 27.57% of the parents of children could tell us the correct dosage schedule for all the drugs prescribed.

KEYWORDS : Medical audit, Pediatrics, Prescription, Drug dispensing

Drug utilization is the defined marketing, distribution, prescription and the use of drugs in society, with special emphasis on the resultant medical, social and economic consequences (Kanakambal, 2001; WHO, 1977). To improve the overall drug use, especially in developing countries, international agencies like the World Health organization (WHO) and the International Network for the rational use of drugs (INRUD) have applied themselves to evolve standard drug use indicators (Biswas, 2001). These indicators help us to improve our performance from time to time.

To assess the scope for improvement in rational drug use in outpatient practice, the World Health Organization (WHO) has formulated a set of "core drug use indicators" (Biswas, 2001) (Table 1). The core prescribing indicators measure the performance of prescribers, the patient care indicators measure what patients experience at health facilities, and the facility indicators measure whether the health personnel can function effectively. Therefore the present study was planned to identify scope of improvement in rational drug use in outpatient practice in the pediatrics in a growing medical college by auditing the prescriptions

from Department of Pediatrics to measure "prescribing and patient care indicators".

MATERIALS AND METHODS

The current prospective study was planned and executed by the Department of Pharmacology & Microbiology in collaboration with Medical Records Department and Pharmacy, MSDS Medical College, Fatehgarh in February 2013 using "Core drug use indicators" formulated by World Health Organization, a validated tool. Study period was one year. We audited 3202 individual drugs on 1186 prescriptions during the study period.

The study population consisted of the patients (children) seeking care at Department of Pediatrics, MSDS Medical College on outpatient (OPD) basis. MSDS Medical College is a state of the art tertiary care teaching institution established in rural outskirts of Fatehgarh to provide super specialty care to underserved population. The first batch of students commenced its academic session in July 2011. Department of Pediatrics is serving primarily patients mainly from lower socio-economic strata of community not

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Table 1 : Core Drug Use Indicators to Investigate Drug Use in Health Facilities*

Prescribing Indicators
1. Average number of drugs per encounter
2. Percentage of drugs prescribed by generic name
3. Percentage of encounters with an antibiotic prescribed
4. Percentage of encounters with an injection prescribed
5. Percentage of drugs prescribed from essential drugs list or formulary
Patient Care Indicators
6. Average consultation time
7. Average dispensing time
8. Percentage of drugs actually dispensed
9. Percentage of drugs adequately labeled
10. Patient's knowledge of correct dosage
Facility Indicators
11. Availability of copy of essential drugs list or formulary
12. Availability of key drugs
<i>*World Health Organization</i>

only from western Uttar Pradesh but also from neighboring states. The "minimum" recommended sample size for a study carried out in a single health facility is 100 encounters (WHO, 1993). On an average 70-120 patients (children) seek care at Department of Pediatrics, MSDS Medical College on outpatient (OPD) basis per day. So this growing institution provided us a perfect base to plan and execute this study.

Data was collected one a week for a period of one year. The day of data collection was chosen randomly. A trained person conducted the interviews just after the parents came out of the OPD room. Data was captured on predesigned WHO proforma. The data for the "prescribing indicators" was recorded by scrutinizing the prescription immediately after the patient-doctor interaction. Investigator would then instruct the parent to collect the prescribed drugs from the hospital pharmacy, and to meet her again to record data for the "patient care indicators". Which drugs were dispensed was determined by examining the drug packages/bottles the parent had actually received. It was noted whether they had been adequately labeled, viz. whether the name of the patient, the generic name of the drug and when the drug should be taken was written on them. Lastly, the parent's knowledge of when and in what quantity each drug that was actually dispensed should be taken was evaluated. Failure to know either of these two points would result in parent's knowledge being scored as inadequate.

To collect data to calculate the average consultation and dispensing times, investigator had to put time on the prescription one he is entering the room of doctor for consultation and at the moment, he is coming out. Similarly marking of time was made while collecting medicines from pharmacy.

Permission of Institutional ethics committee (IEC) was sought before the commencement of the study. Informed consent was obtained from the study participants. All the questionnaires were manually checked and edited for completeness and consistency and were then coded for computer entry. After compilation of collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed using appropriate statistical methods.

RESULTS

The mean age of the patients was 3.4 ± 3.1 years (range 2 months -12 years). Males 772 (65.1%) outnumbered female patients 414 (34.9%). 3202 individual drugs were prescribed on 1186 prescriptions during the study period. Average number of drugs per encounter was 2.8 ± 0.85 .

Number of drugs prescribed per prescription among study subjects varied from one to eight. Almost 70% of the prescriptions contained two or three drugs per prescription. Maximum number of drugs (7 and 8) were

Table 2: Number of Drugs Prescribed Per Prescription Among Study Subjects

Number of drugs per prescription	No. of prescriptions	
	N	Percentage
One	70	5.90
Two	367	30.94
Three	485	40.89
Four	148	12.48
Five	77	6.49
Six	35	2.95
Seven	2	0.17
Eight	2	0.17
Total	1186	100

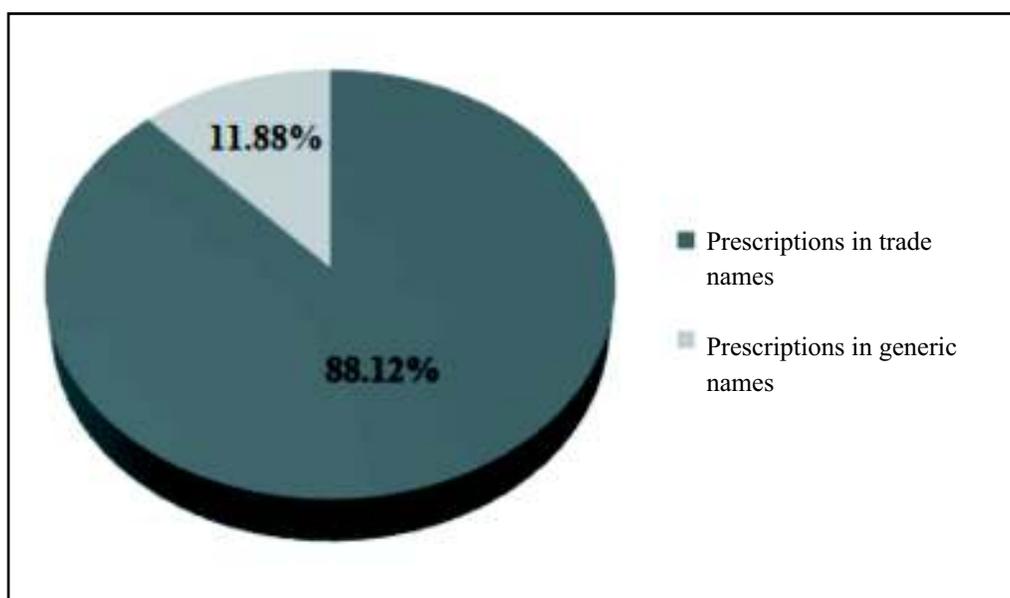


Figure 1: Bar Chart Showing Prescription of Drugs in Trade/generic Names

prescribed to only 4 (0.34%) patients. (Table 2)

Regarding prescribing drugs by generic names or trade names, prescriptions in trade names (1045, 88.12%) dominated prescriptions in generic names (141, 11.88%). (Figure 1)

Drugs were prescribed in seven different dosage forms. The most common mode of drug prescription was syrup, followed by tablets and capsules, oral rehydration salts (ORS), eye/ear/nose drops, nebulizations, lotions and injectable. Use of antibiotics was frequent.

The number of encounters with antibiotics was 533. Antibiotics constituted almost 45% of the total number of drugs prescribed. Most of the antibiotics were prescribed

for acute gastroenteritis, acute respiratory infections and febrile illnesses. Most frequently prescribed antibiotics were ampicillin, co-trimoxazole, amoxicillin and erythromycin. 81.96% of drugs were prescribed from WHO essential drug list. Sixty four percent of drugs were actually dispensed by the hospital pharmacy.

Most drugs (79.43%) were not adequately labeled as the name of the patient and the generic name of the drug were not written. Similarly, only 27.57% of the parents of children could tell us the correct dosage schedule for all the drugs prescribed. Regarding patient care indicators, average consultation time and average dispensing time calculated was 3.5 minutes and 2.7 minutes respectively. (Table 3)

Table 3 : Core Drug Use Indicators of Current Study and Comparison With Other Indian Studies

Core Drug Use Indicators	Current Study	Comparison	
		Hazra et al	Rishi et al
Average number of drugs prescribed	2.8	3.2	3.6
% of drugs prescribed by generic names	11.88% (n=141)	46.2%	51.0%
% of encounters with an antibiotic prescribed	44.94% (n=533)	72.8%	77.2%
% of encounters with an injection prescribed	1.94% (n=23)	3.9%	7.0%
% of drugs prescribed from essential drug list	81.96% (n=972)	45.7%	-
Average consultation time (Min)	3.5	3.7	-
Average dispensing time (Min)	2.7	3.1	-
% of drugs actually dispensed	64.0% (n=759)	11.6%	64.6%
% of drugs adequately labeled	20.57% (n=244)	56.2%	0.0%
% patients with correct knowledge of dosage	27.57% (n=327)	64.5%	71.5%
Essential Drugs List / formulary available	No	No	-
% availability of key drugs	73.02% (n=866)	-	-

DISCUSSION

The current study assessed the scope for improvement in rational drug use in outpatient practice in the pediatrics department of a tertiary care teaching institution. Valid conclusions were drawn on the basis of data collected by scrutinizing the prescriptions written by pediatric resident doctors and by interviewing parents of 1186 outpatient children.

Average number of drugs/injections per encounter is an important index of the scope for intervention in prescribing practices. Our figure of 2.9 drugs per encounter is higher than the recommended limit of 2(WHO, 1993). Similar findings have been reported in other Indian studies (Hazra, 2000; Rishi, 2003). However, this finding is in contrast to the study studies from Bangladesh and Lebanon who have reported rational figures of 1.4 and 1.6, respectively (Guyon, 1994; Hamadeh, 2001). Not surprisingly our study shows that three or more drugs were prescribed in more than 63% of prescriptions. More number of medications increases the risk of drug interactions, of dispensing errors and of the parent not knowing the dosage schedules. It can be minimized by rational prescribing.

Regarding prescribing drugs by generic names or trade names, we observed that prescriptions in trade names dominated prescriptions in generic names. Increasing generic prescribing would rationalize the use and reduce the cost of drugs. Higher figures (75% to 99.8%) of generic prescribing has been reported from Cambodia and Tanzania (Chareonkul, 2002; Hong, 1996).

Regarding patient care indicators, our study revealed that only 64% of drugs were actually dispensed by the hospital pharmacy. It is quite below of satisfactory level. Drugs should be available in the hospital pharmacy so that it can be dispensed to poor people. Otherwise they have to purchase the medicines from the market which will impose economic burden on them. Its failure on the part of people involved in management of hospital pharmacy. Reasons may be multiple. One of the reasons was not calculating the medicines demand by the department on regular basis. On the other hand failure to maintain buffer stock by the pharmacy was another reason for shortage of drugs in the pharmacy. Certain drugs prescribed as syrups (for example, calcium supplements, iron-folic acid supplements, mebendazole, metronidazole, multivitamins, pheniramine maleate, and salbutamol) were not dispensed although they were available in tablet form. Therefore one must keep certain practical aspects like appropriate proportion of dosage form being utilized in mind while preparing demand of medicines for the pharmacy.

This study has several strengths. First, we have identified scope of improvement in rational drug use in outpatient practice in the pediatrics in a growing medical college. In-depth analysis of this aspect has not been closely investigated by many experts in the field. This study becomes very important as long lasting impact can be achieved if rectifications of deficiencies are identified well in time and corrected at the earliest. Second, all the investigations were conducted by authors of the study only,

which creates a sense of uniformity. Third, we have utilized Core drug use indicators devised by WHO. This is already a standard validated tool. Fourth, it also covers certain time management indicators which is a less explored entity but very important aspect which is neglected by researchers in medical field.

The study has some limitations as well. First, some may argue that the results obtained may not be applicable to all the medical colleges. I agree because these findings are based on a single centre study. Results may vary with different geographical terrain. More multicentric studies need to be carried out. Second, we have not taken certain indicators related to quality of treatment such as quality of patient examination, quality of diagnosis and quality of treatment. In fact it is a limitation of study tool i.e. Core drug use indicators devised by WHO. Third, improvement after rectifications of deficiencies identified should have been measured.

CONCLUSION

The findings of this study can be utilized in strategic planning to ensure better patient care services in the institution. Targeted efforts are needed to rectify over prescription of antibiotics and syrup formulations, inadequate labeling of drugs and lack of access to an essential drugs list are necessary to improve rational drug use in our facility. Baseline data generated from the current study can be utilized for comparison when in future any pediatric drug utilization study is carried out.

REFERENCES

Biswas N. R., Jindal S., Siddiquei M. M. et al., 2001. Patterns of prescription and drug use in ophthalmology in a tertiary hospital in Delhi. *Br J Clin Pharmacol*, **51**: 267-69.

Chareonkul C., Khun V. L. and Boonshuyar C., 2002. Rational drug use in Cambodia: study of three pilot health centers in Kampong Thorn Province. *Southeast Asian J. Trop. Med. Public Health*, **33**: 418-424.

Guyon A. B., Barman A., Ahrned J. U., Ahmed A. U. and Alam M. S., 1994. A baseline survey on use of drugs at the primary health care level in Bangladesh. *Bull WHO*, **72**: 265-271.

Hamadeh G.N., Dickerson L.M., Saab B.R. and Major S.C. Common prescriptions in ambulatory care in Lebanon. *Ann Pharmacother* 2001; **35** : 636-640.

Hazra A., Tripathi S. K., Alam M. S., 2000. Prescribing and dispensing activities at the health facilities of a non-governmental organization. *Natl. Med. J. India* **13** : 177-182.

Hong S. H. and Shepherd M. D. Outpatient prescription drug use by children enrolled in five drug benefit plans. *Clin Ther* 1996; **18**: 528-545.

International Network for Rational Use of Drugs and World Health Organization. How to investigate drug use in health facilities: Selected drug use indicators. EDM Research Series No. 7 [WHO/DAP/93.1]. Geneva: World Health Organization, 1993.

Kanakambal S., Muruges N. and Shanthi M., 2001. Drug prescribing pattern in a tertiary care teaching hospital in Madurai (Tamil Nadu). *Indian J. Pharmacol*, **33**: 223.

Rishi R.K., Sangeeta S., Surendra K. and Tailang M., 2003. Prescription audit: experience in Garhwal (Uttaranchal), India. *Trop. Doct.*, **33** : 76-79.

WHO, 1977. The selection of essential drugs. WHO technical report, **615**: 36.