

## Drug Use Pattern in Children at a Teaching Hospital

S DIMRI, P TIWARI, S BASU\* AND VR PARMAR\*

From the Department of Pharmacy Practice, National Institute of Pharmaceutical Education and Research (NIPER), Sector 67, SAS Nagar, Punjab; and \*Department of Pediatrics, Government Medical College and Hospital, Sector 32, Chandigarh, India.

### Correspondence to:

Dr P Tiwari, Professor and Head,  
Department of Pharmacy Practice,  
National Institute of Pharmaceutical  
Education and Research (NIPER),  
Sector 67, SAS Nagar,  
Punjab 160 062, India.  
E-mail: ptiwari@niper.ac.in  
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This study aimed to evaluate drug utilization in pediatric out-patient department of a tertiary care teaching hospital. The patient and drug information of 254 patients was analyzed for WHO recommended prescribing indicators. The average number of drugs per prescription was 2.31 and 45% of medicines were prescribed from National List of Essential Medicines. The use of injectibles was low (1.18%) while an antibiotic was prescribed in 29.1%. Only 5.8% medicines were prescribed by generic name. Interventions are required to improve prescribing by generic name so as to further rationalize drug use in pediatric population.

**Keywords:** Drug utilization, India, Out-patients, Pediatrics.

Children are more vulnerable to the various adverse events related to use of drugs(1). It is, therefore, important to study drug use patterns in pediatric population in order to optimize the pharmacotherapy. With the help of WHO prescribed drug use indicators(2) and concept of defined daily doses(3), it is possible to compare drug utilization patterns between different settings. The aim of this study was to evaluate the drug utilization in the out patient pediatric setting of a public tertiary care teaching hospital.

### METHODS

The study was carried out in the pediatric out-patient clinic of a tertiary care teaching hospital in Northern India over a period of three months (September to November, 2006). Children attending for vaccination and if advised hospitalization, were excluded. Baseline data record included patients' demographics, diagnosis, dosage, dosage form and route of administration of drugs prescribed. The patients were selected by convenience sampling.

The data were analyzed for the WHO recommended prescribing indicators(4). The prescribing and utilization pattern of the medicines was carried out with reference to National List of Essential Medicines (NLEM) India, 2003(5). The results are presented as mean±SEM and percentages, as applicable.

### RESULTS

Of 254 patients, 172 were male. The average age of the patients was 3.9±0.2 years. The prescribing indicators were calculated for all patients and studied in five age groups to identify possible differences (**Table I**).

The average number of medicines prescribed was 2.31±0.58. It was found that in most of the prescriptions (44.1%), two drugs were prescribed; this was followed by three drugs in one prescription in 27.2% of the total prescriptions. Five drugs were prescribed in only 2% of the prescriptions. Out of 587 medicines, 264 (45%) medicines were

prescribed from the NLEM. The prescribing from NLEM was highest for age group 8-12 years (65.6%). Paracetamol, amoxicillin, salbutamol, albendazole and antacid preparations containing aluminium and magnesium hydroxide contributed to the majority (76%) of drugs prescribed from the NLEM. There was a poor tendency of prescribing by generic name; only 34 medicines were prescribed by generic name. Albendazole, paracetamol, amoxicillin and vitamin K were the most common medicines prescribed by their generic name.

The percentage encounter with an antibiotic prescribed was found to be 29.1%. All the antibiotics were targeted for upper and lower respiratory tract infections (URI and LRTI). Children less than 4 years received a larger proportion of antibiotics. The use of injections was very low (1.2%). Paracetamol was the most frequently prescribed medicine (83 cases) followed by paracetamol combinations, decongestants and antiallergics, and amoxicillin. Of the antimicrobial agents, amoxicillin was most commonly prescribed accounting for more than 50% of all cases prescribed with an antimicrobial agent. This was followed by azithromycin and cotrimoxazole.

72% of medicines were prescribed as syrup followed by tablet (16.1%). All others dosage forms comprised only 5.8%. The dosage was defined as teaspoonful (TSF). For 271 out of 425 liquid preparations, dosages were mentioned as TSF. Most of the patients had single diagnosis; URI was the most common diagnosis followed by LRTI and anemia. The diagnosis was illegible or not available in 50 cases.

## DISCUSSION

The results confirmed that average number of drugs (2.31) is slightly higher than the recommended value of 2(6). However, this is smaller than earlier Indian reports(7,8). The average number of drugs in this study matches those previously reported(9,10,12,13) while values under 1.4 have been reported from Sweden(9), Italy(11) and Barcelona(12).

Prescribing by generic name is known to reduce the cost of drug treatment and rationalizing drug therapy. This varies from 13.3-93% across the globe (10,13,14). The results of work conducted in India report this as 73.4% (8) which does not compare very well with the figure of 5.8% found in this study. This needs further investigation. It should be noted that this study is only a preliminary one and is ongoing. One of the reasons for poor prescribing by generic name is the non-availability of the pediatric formulations in the hospital pharmacy. Hence, clinicians often prefer to prescribe by trade names, with which they are familiar and the patients find it easier to procure. There was fair prescribing from NLEM but it is less than that reported earlier(8,13). This is another important area with a scope of improvement.

The household administration of liquid dosage form has been identified as one of the important factor contributing to medication error in pediatric patients(15). It has been reported that dosage prescribed on TSF basis can lead to underdosing because while the quantity defined as 'a teaspoonful' is equivalent to 80 grains or 5.2g of water and the teaspoons available at home vary in size(16).

**TABLE I** PRESCRIBING INDICATORS IN DIFFERENT AGE GROUPS

	0-1 yr	1-4 yr	4-8 yr	8-12yr	>12yr	Total
Number of patients (%)	69 (27.2)	97 (38.2)	59 (23.2)	27 (10.6)	2 (0.79)	254 (100)
Average no of drugs per prescription	2.3	2.4	2.2	2.2	1.5	2.3
% Drugs prescribed from NLEM	39.2	42.5	47.7	65.6	33.3	45
% Drugs prescribed with generic names	4.4	7.23	6.15	3.27	0	5.8
% Encounter with an antibiotic prescribed	33.3	33	17	30	50	29
% Encounter with an injection prescribed	0	1.03	3.3	0	0	1.2

### WHAT THIS STUDY ADDS?

- Prescribing from the National List of Essential Medicines was fair and use of injections was low in this study.

Because 72% medications were prescribed as syrups, this is an area of major concern. Prescribing dosage as mL and use of syringe or graduated caps to measure accurate amount should be strongly advocated in pediatric setting.

To conclude, this study provides few insights into the drug use patterns in a pediatric out patient department of a tertiary care teaching hospital. The prescribing from NLEM was fair, the use of injections was low and there is a scope for improvement in case of medicines prescribed by generic name.

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*Contributors:* PT was involved in designing the study and preparation of manuscript and he will act as guarantor of the study. SD was involved in data collection and review of literature. SB has helped in manuscript writing. VRP, SB, SD and PT were involved in analysis and interpretation of the data.

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