



A STUDY ON DRUG UTILIZATION PATTERN IN OUTPATIENT PAEDIATRIC DEPARTMENT

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ABSTRACT

Introduction: Paediatrics is relating to the branch of science that deals with the medical care of infants, children and adolescents. Drug utilization evaluation play a significant role in helping the health-care system to understand, explain and improve the prescribing administration and use of medications. Pharmacokinetics and pharmacodynamics in paediatrics differs from that of adults. Our knowledge of pharmacology of the drugs used in paediatrics has advanced with a greater understanding of their pharmacokinetics and pharmacodynamics. Prescription analysis may helpful to patients to increase the medication adherence, Patient safety, Economic status and decrease the irrational use of drugs. Prescription analysis helps in

promoting rational use of drugs in which right drug is prescribed for right condition in right dose and duration and gives information about any dispensing errors. The ultimate goal is to achieve rational and effective pharmaceutical care to the paediatrics. This has resulted in a clarification of their uses, wider indications, and alternative methods of delivery. Drug utilization evaluation studies become one of the powerful tools in evaluation of health system. Drug utilization studies focuses on factors related to prescribing, dispensing, administering and taking of medication and associated events. **Method:** We conducted a single centered observational and prospective analysis of paediatrics age below 12 years at Ala hospital, Amaravathi road, Guntur. A total number of 478 prescriptions were recorded. The drug data such as name of the drug, dosage form, dosing frequency, route of administration were also noted. The data obtained and the patient related parameters were computed using SPSS. The results were presented as percentage. **Conclusion:** This study

provides the information about the prescribing patterns of drugs in the paediatric outpatient department. And conclude the role of clinical pharmacist is vital to be an integral part well as to clear the irrational use of medicines in paediatrics. Pharmaceutical care is needed in the correct management of drugs which is even more important in case of paediatric patients. The WHO core indicators helped to improvise the prescribing pattern, identify significant problems involved in the knowledge gap of patients or caretakers understanding of instructions provided by consultants and even to minimize the cost burden on patient.

KEYWORDS: Paediatrics, Prescription pattern, drug utilization evaluation.

INTRODUCTION

PAEDIATRICS is a branch of medicine which deals with the development, disorders and diseases of children.^[1]

Age groupings in paediatrics

Neonate - new born – 30 days of age

Infant - 1 month – 2 years

Young Child - 2 – 6 years

Child - 6 – 12 years

Adolescent - 12- 18 years^[2]

Prescription

A physician's order for the preparation and administration of a drug or device for a patient. Prescription analysis may helpful to patients to increase the medication adherence, Patient safety, Economic status and decrease the irrational use of drugs. Prescription analysis helps in promoting rational use of drugs in which right drug is prescribed for right condition in right dose and duration and gives information about any dispensing errors. The ultimate goal is to achieve rational and effective pharmaceutical care to the paediatrics.^[3,4,5]

A prescription is an instruction from a prescriber to a dispenser. The prescriber is not always a doctor but can also be a paramedical worker, such as a medical assistant, a midwife or a nurse. The dispenser is not always a pharmacist, but can be a pharmacy technician, an assistant or a nurse. Every country has its own standards for the minimum information required for a prescription, and its own laws and regulations to define which drugs require a prescription and who is licensed to write it. Many countries have separate regulations for

opiate prescriptions.^[1]

A prescription should include

- Name, address, telephone of prescriber
- Date
- Generic name of the drug, strength
- Dosage form, total amount
- Label: instructions, warnings
- Name, address, age of patient
- Signature or initials of prescriber^[5]

The following simple suggestions can help to avoid confusion and make the handwritten prescription more patient-friendly.

To estimate a children dose based on the adult dose, using certain formulae give below.^[6]

Clark's Rule

$$\frac{(\text{Weight in pounds}) \times (\text{Adult dose})}{150}$$

Fried's Rule

$$\frac{(\text{Age in months}) \times (\text{Adult dose})}{150}$$

Young's Rule

$$\frac{(\text{Age in years}) \times (\text{Adult dose})}{\text{Age} + 12}$$

Dilling's Rule

$$\frac{\text{Dose of a child} = (\text{age in years}) \times (\text{adult dose})}{20}$$

Other Formulae

$$1. \text{ Dose of a child} = \frac{(\text{BSA of a child}) \times (\text{Adult dose})}{\text{BSA Of Adult}}$$

$$2. \text{ Dose of a child} = \frac{(\text{BSA of a child}) \times (\text{Adult dose})}{173}$$

Drug Utilization Evaluation

Rational drug use is an important factor to be checked for the optimal benefit of drug therapy in patient care. In India, many factors like illiteracy poverty, use of multiple health care system, drug advertising and promotion, sale of prescription, competition in medical and pharmaceutical market place and limited availability of drug information are the main reasons for not achieving the optimal health care. Inappropriate use of drug also leads to increased cost of medical care, antimicrobial resistance, adverse effects and utilization evaluation (DUE) studies becomes one of the potential tools in evaluation of health system. Drug utilization studies focuses on factors related to prescribing, dispensing, administering and taking of medication and associated events.^[7,8,9]

Classification of Drug Utilization Evaluation

DUR is typically classified into three different categories.

1. ProspectiveDUR

Prospective review evaluation a patients planned drug theory before a medication described. This DUR helps the pharmacist to access the prescription medications and resolve drug related problems.

2. ConcurrentDUR: It is performed during the course of treatment and the ongoing monitoring of drug therapy for the positive patient outcomes.

3. RetrospectiveDUR

It is a review of drug therapy after the patient has received the medication. A retrospective review aims to detect the pattern in prescribing, dispensing or advertising drugs and it helps to prevent recurrence of inappropriate medication use. The advantage of this DUR is ease of data collection, as records are assessed at the data collector's convenience. A disadvantage is that some information may be unclear or missing and reviewed patients may not gain immediate benefit, as interventions are delayed until the intervention phase.^[7, 9, 10]

Steps in DUE

Drug utilization evaluation process is divided into four phases^[7, 9]

Phase 1: Planning

1. Develop a DUR committee.
2. Write policies and procedures.

3. Describe about the departments of the hospital, where drugs are utilized (intensive care unit, radiology, surgical department, medical department).
4. Select specific drugs for possible inclusion in the program.
5. Assess resources available for critical development, data collection, and evaluation.
6. Consider the indications, dosing, dosage form, frequency of drug used to monitor and evaluate.
7. Select criteria and establish performance thresholds.
8. Develop the methodology for data collection, evaluation and create a schedule.
9. Educate hospital staff about DUE study and current criteria.

Phase 2: Data Collection and Evaluation

10. Start the data collection in proper way.
11. Evaluate the collected data and determine if drug use problem exist.

Phase 3: Interventions

12. Send the results to hospital staff.
13. If a drug use problem was found, design and implement interventions.
14. Collect new data on problem drug to determine with drug use has improved as a result of the intervention.
15. Disseminate results of re-evaluation.

Phase 4: Program Evaluation

16. Evaluate all DUR program activities at the end of the year, and plan the new activities for the upcoming year. ^[11]

Prescribing Indicators

- a. Average number of drug prescribed per patients.

= $\frac{\text{Total number of drug prescribed}}{\text{Total number of encounter sample}}$

(OR)

Combinations of drug prescribed for one health problem were counted as on

- b. Percentage of encounters with an antibiotic prescribed

= $\frac{\text{Number of drugs prescribed by generic name} \times 100}{\text{Total no of drugs prescribed.}}$

c. Percentage of encounter with an antibiotic prescribed

= $\frac{\text{Percentage of patient encounter with an antibiotic} \times 100}{\text{Total no of encounter sample}}$

Total no of encounter sample

d. Percentage of encounter with an injection prescribed

= $\frac{\text{Number of patient encounters with an injection prescribed} \times 100}{\text{Total number of encounter sample}}$

Total number of encounter sample.

e. Percentage of drugs prescribed from essential drug list

= $\frac{\text{Number of drugs prescribed from essential drug list} \times 100}{\text{Total no of prescribed drugs}}$

Total no of prescribed drugs

MATERIALS AND METHOD

We conducted a single centered observational and prospective analysis of paediatrics age below 12 years at Ala hospital, Amaravathi road, Guntur. A total number of 478 prescriptions were recorded. The drug data such as name of the drug, dosage form, dosing frequency, route of administration were also noted. The data obtained and the patient related parameters were computed using SPSS. The results were presented as percentage.

Inclusion criteria

Patients with age group of 0-12 years. All out-patient paediatric department.

Exclusion criteria

Patients with age group of above 12 years. Intensive care unit patients.

Ethical Consideration

Ethical committee approval was taken before initiation of the study.

Protocol Number

NIPS/PROTOCOL/04/2018.

RESULTS AND DISCUSSION

Distribution Based on Gender

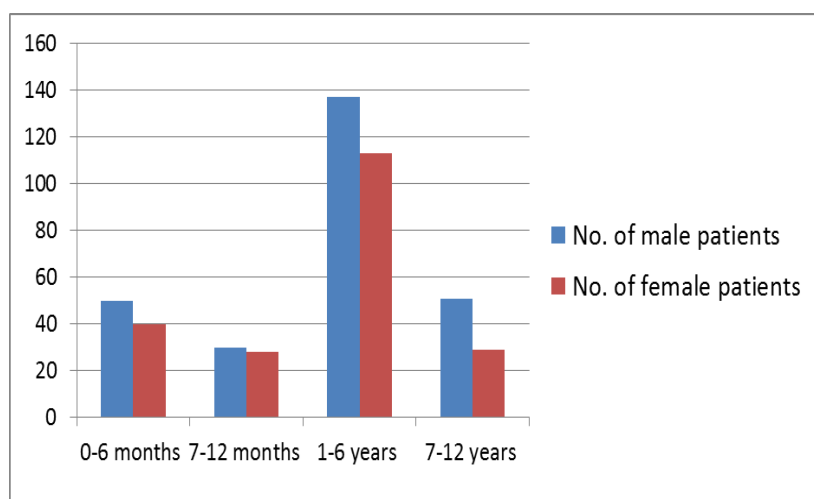
A total of 478 patients were enrolled in the present study during the study period. Out of that 268 (56%) were males and 210 (44%) were females are effect diseases.

Table. 1: Distribution based on Age Group

Age group	Number of male patients	Number of female patients
0-6 months	50	40
7-12 months	30	28
1-6 years	137	113
7-12 years	51	29

The age distribution with gender of patients enrolled in the study is present in below table.

The results revealed that most of the patients were from 1-6 years age group.

**Figure. 1: Distribution Based on Age Group.****Table. 2: Number of Drugs Prescribed Per Prescription**

Prescription containing number of drugs	Percentage of prescriptions (%)
One	16(3%)
Two	50 (10%)
Three	108 (23%)
Four	178 (37%)
Five	103 (22%)
Six	23 (5%)

The number of drugs per prescription were listed in the below table. The results revealed that 37% of the total prescriptions of the study populations contained four drugs per prescription.

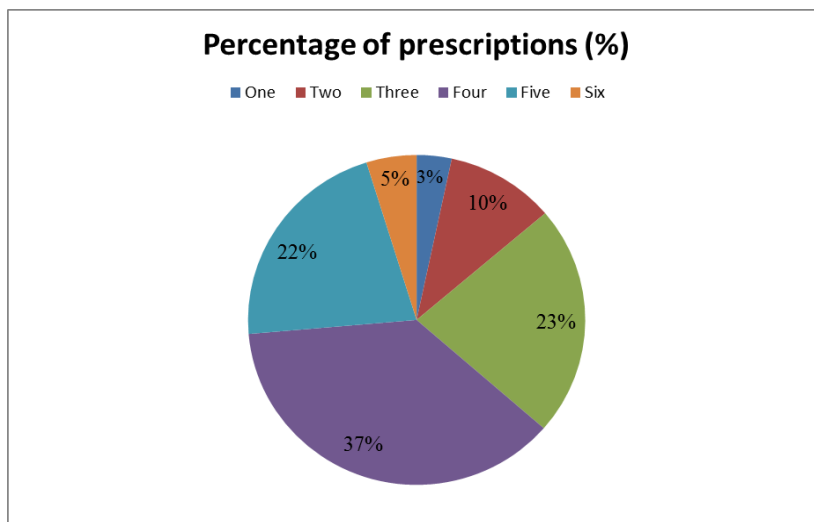


Figure. 2: Number of Drugs Prescribed Per Prescription.

Table. 3: Number of Prescriptions Based on Category of Drugs.

Category of drugs	Number of prescriptions
Antibiotics	395
Multivitamins	304
Anti-emetics	21
Alpha-agonist	63
Anti-septic	19
Anti-fungal	11
Antacid	8
NSAIDS	2
Anti-helminthics	6
Antipyretics	368
Bronchodilators	248
Anti-histamines	421
Anti epileptics	2

The category of drugs used in the study population and their usage in the total prescriptions are given in the below table.

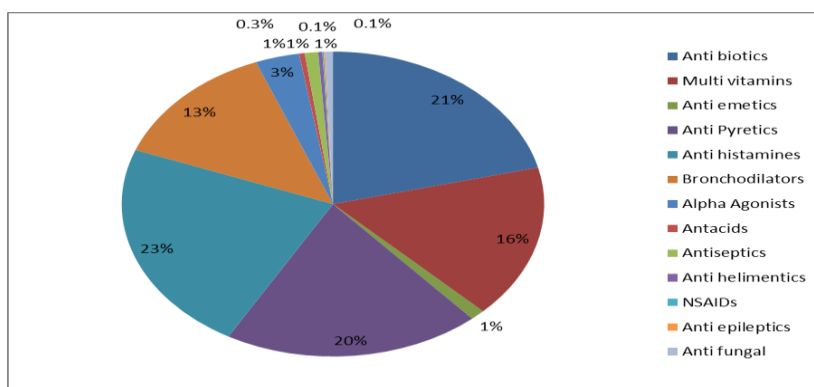


Figure. 3: Number of Prescriptions Based on Category of Drugs.

The results revealed that 21% of the prescriptions contained anti-histamines in highest number in the study population

Table. 4: Analysis of prescriptions in the light of W. H. O prescribing indicators.

Parameters	Observed value
Total number of prescriptions analyzed	478
Total number of drugs prescribed	1871
Average number of drugs per encounter	3.9
Total number of antibiotics prescribed	394
Percentage of encounters with an antibiotic prescribed	82.5%
Percentage of encounters with injections prescribed	27.2%
Percentage of drugs prescribed from essential drug list	34.95%

A total of 478 prescriptions were collected randomly and analyzed. A total of 1871 drugs were prescribed, Average number of drugs per encounter were 3.9. Drugs prescribed from essential drugs list (WHO) were 654 (34.95%). Total number of antibiotics prescribed were 394. Percentage of encounters with an antibiotic prescribed were 82.5%. Percentage of encounters with injections prescribed were 27.2% as listed below.

DISCUSSION

Our study title Drug utilization pattern in outpatient paediatric department is single centre, prospective, observational study conducted in 478 paediatric patients. A total of 478 cases evaluated 268 were males, 210 were females. Among the age distribution with gender of patients enrolled in the study the results revealed that most of the patients were from 1-6 years age group (figure-1). The number of drugs per prescription were analyzed the results revealed that 37% of the total prescriptions of the study populations contained four drugs per prescription and least is 1 drug per prescription (3%) as shown in fig-2.

Among the dosage forms drops, syrups, tablets, injections, capsule. Syrups have been highly prescribed 61%. The most common drug prescribed was Antihistamines of 23% Antibiotics are of 21%, Anti pyretics are of 20% and NSAIDs, Antiepileptics are presents very low that is 0.1% as shown in fig-3. This shows that prescribers more intended to prescribe Antihistamines, Antibiotics, Anti pyretics commonly. In table-4 we can see a total of 1871 drugs were prescribed, Average number of drugs per encounter were 3.9. As per WHO, the average number of drugs per encounter should be 1.6-1.8. Our study reveals poly pharmacy which reflects the usual practice of private setup clinics.

Drugs prescribed from essential drugs list (WHO) were 654 (34.95%). Essential drug offers a cost-effective solution to many health problems in a developing country. They should be selected with due regard to disease prevalence, be affordable, with assured quality and be available in the appropriate dosage forms. In our study, the percentage of drugs prescribed from the essential drugs list was 34.95% which was low. This may be due to lack of awareness of Essential Drug List. Total numbers of antibiotics prescribed were 394. Percentage of encounters with an antibiotic prescribed was 82.5%. According to WHO 15-25% of prescriptions with antibiotics is expected in most of developing countries where infectious diseases are more prevalent. Various studies from India also report a high rate ranging from 40-80%. The prescribers need to be more cautious before prescribing any antibiotic to avoid unnecessary burden on patient and development of resistance on patients. Percentage of encounters with injections prescribed was 27.2%. The use of injection for treatment is accompanied with variety of disadvantages including sepsis at administration, increased risk of tissue toxicity from local irritation, costly, difficulties in correcting the error, thus, WHO recommended that less than 10% prescription should include one or more injections.

CONCLUSION

This study provides the information about the drug utilization patterns in the paediatric outpatient department. It has helped to identify irrational prescribing patterns of drugs in paediatrics. Hence, the clinical pharmacist must be considered to be an integral part. They should be involved in collection and presentation of prescribing data as a part of clinical audit and also counselling of patients care takers. Pharmaceutical care is needed in the correct management of drugs which is even more important in case of paediatric patients. The WHO core indicators helped to improve the prescribing pattern, identify significant problems involved in the knowledge gap of patients or caretakers understanding of instructions provided by consultants and even to minimize the cost burden on patient.

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