



EVALUATION OF DRUG UTILIZATION PATTERN IN THE PEDIATRIC DEPARTMENT OF A TERTIARY CARE HOSPITAL IN SRINAGAR, JAMMU & KASHMIR, INDIA

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ABSTRACT

Introduction: Irrational drug use, especially antimicrobials in a pediatric population, has become a commonly noted practice. Most of the drugs prescribed for children have not been tested in the pediatric population due to the difficulties in carrying out clinical studies in children and ethical issues due to children not being able to make their own decisions to participate in a clinical trial. **Objective:** The main aim of this study was to evaluate the pediatric drug utilization pattern in a tertiary care hospital. **Material and methods:** This study was conducted at a Tertiary care hospital, Srinagar, Jammu & Kashmir, India for a period of 6 months. It was a prospective, descriptive, cross sectional study. **Results:** This study evaluated a total of 205 patients from the inpatient department of pediatric department of Tertiary care hospital, Srinagar, Jammu & Kashmir, India. Out of 205 patients 62.4% (128) were male and 37.6% (77) were female. The number of male patients was more than the number of female patients. A total of 767 medicines were prescribed to 205 patients. Mean \pm SEM of medicines prescribed was 3.74 ± 0.07 . Mean \pm SEM of medicines prescribed 125 for male patients were 3.76 ± 0.10 , while for female patients it was 3.69 ± 0.11 . **Conclusion:** Development and implementation of Standard Treatment Guidelines (STGs) based on essential drug concept and promoting rational drug therapy will lead to more and more rational prescribing in pediatrics. Periodic prescriptions analysis and effective feedback to clinician should be done based on results to ensure rational prescribing and effective health care management, which will ultimately lead to a better child health.

Keywords: Pediatrics, drug utilization, antibiotic usage, Standard Treatment Guidelines, Prescribing patterns, Clinician.

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INTRODUCTION

Knowledge of drug administration in children and infants lags behind that of adults for many reasons. These include developmental differences that affect the pharmacodynamic and pharmacokinetic profiles of drugs, ethical and financial reasons, research capabilities, and regulatory guidelines and constraints. Most of the drugs prescribed for children have not been tested in the pediatric population due to the difficulties in carrying out clinical studies in children and ethical issues due to children not being able to make their own decisions to participate in a clinical trial. Epidemiological evaluation of medicine use in elderly is now a highly visible topic, but drug prescribing studies in pediatric patients have been limited. The higher incidence of infections in pediatric population as compared to adults leads to higher prescription of Antimicrobial Drugs (AMDs), at times more than two in single prescription. The use of antibiotics in children has been a major area of concern. Periodic prescriptions analysis and effective feedback to clinician should be done based on results to ensure rational prescribing and effective health care management, which will ultimately lead to a better child health.^[1]

Irrational drug use, especially antimicrobials in a pediatric population, has become a commonly noted practice. A study in the USA and Canada has shown that 50% and 85% of antibiotics, respectively, were prescribed inappropriately to children.^[2] Evidence suggests that medication errors have a higher incidence in children and infants than in adults.^[3] The irrational use of drugs is known to an increase in the cost of treatment, incidence of adverse drug reactions. Markets for children's medicines tend to be small and the range of doses used may be wide for any drug formulation because many drugs prescribed widely for infants and children are not available in suitable dosage forms, leading to a lack of attention to pediatric medicines. Most of the drugs prescribed for children have not been tested in the pediatric population due to the difficulties in carrying out clinical studies in children and ethical issues due to children not being able to make their own decisions to participate in a clinical trial. Therefore, many medications have not been approved by the Food and Drug Administration for children.^[4] Epidemiological evaluation of medicine use in elderly is now a highly visible topic, but drug

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prescribing studies in pediatric patients have been limited. The need for the safe and effective drugs for use in sick neonates, infants, children and adolescents requires the establishment of thoughtful drug therapy strategies.^[5] This study was carried out to evaluate drug utilization pattern in the pediatric department of a Tertiary care hospital, Srinagar, Jammu & Kashmir, India.

MATERIAL AND METHODS

This study was conducted at a Tertiary care hospital, Srinagar, Jammu & Kashmir, India for a period of 6 months. It was a prospective, descriptive, cross sectional study and the treatment chart of patients in the inpatient ward of pediatric department was included. The study was approved by Institutional Ethics Committee. Descriptive statistics was used for the analysis of data. The data obtained was represented as mean \pm SEM and percentages, as applicable. Drug data and patient characteristic data were computed using Ms Excel and SPSS statistical package. Appropriate statistical tests were used for determining association between variable. Means have been compared by the Student's t-test. A difference was considered as significant if P value was less than 0.05. ANOVA is used for determining any prescribing differences between age groups.

RESULT AND DISCUSSION

This study evaluated a total of 205 patients from the inpatient department of pediatric department of Tertiary care hospital, Srinagar, Jammu & Kashmir, India.

Profile of the patients

Out of 205 patients 62.4% (128) were male and 37.6% (77) were female.

The mean age of the study was found to be 4.54 years. The mean age was 4.21 and 5.07 years for male and female patients respectively as shown in Table 1.

Table 1: Average Age of the Patients

	Number of patients	Average age \pm SEM
Total	205	4.54 \pm 0.20
Male	128	4.21 \pm 0.25
Female	77	5.07 \pm 0.33

All the patients were divided into five age groups –

- Less than 1 year (group A),
- 1 to 4 years (group B),
- 4 to 8 years (group C),
- 8 to 12 years (group D) and
- Above 12 years (group E).

As presented in Table 2, it was found that the most patients belong to group B i.e.26.83% followed by group A i.e. 26.34% and the least patients belong to group E i.e.8.30%.

Table 2: Age Distribution of the Patients

GROUP	NUMBER OF PATIENTS	PERCENTAGE
A	54	26.34
B	55	26.83
C	41	20
D	38	18.54
E	17	8.30

Prescribing indicators

The prescribing indicators were calculated for all the patients and for the five age groups as presented in Table 3 and Table 4 to determine any differences in prescribing between these age groups. Usage of antibiotics and number of antibiotics per prescription is presented in Table 5 and Table 6 respectively.

Table 3: Number of drugs prescribed per prescription

Number Of Drugs Per Prescription	Number of Prescriptions (%)
One	15 (7.31)
Two	35(17.07)
Three	41 (20)
Four	52 (25.36)
Five	40(19.51)
Six or more	22 (10.73)

Table 4: Top ten medicines prescribed

Drug	No. Of patients
Paracetamol	112
Ceftriaxone	81
Salbutamol	69
Amikacin	52
Normal saline drops	48
Amoxicillin + clavulanic acid	37
Furosemide	33
Cefotaxim+sulbactam	32
Quinine dihydrochloride	27
Lorazepam	18

Table 5: Usage of antibiotics

Antibiotic	No. of patients	ATC code
Ceftriaxone	81	J01DD04
Amikacin	52	J01GB06
Amoxicillin + Clavulanic acid	37	J01CRO2
Cefotaxim + Sulbactam	32	J01RAO3
Vancomycin	9	J01XA01
Cefotaxim	8	J01DD01
Ofloxacin	5	J01MA01
Piperacillin+ Tazobactam	2	J01RA01
Gentamycin	1	J01GB03

Table 6: Number of Antibiotic per Prescription

Number Of Antibiotic Per Prescription	Number of Prescriptions
No antibiotic prescribed	43
One	105
Two	51
Three	5
Four	1

Utilization of different dosage form

As presented in Table 7, a significant number of medicines were prescribed as injection (45.96%) followed by syrup (17.86%), tablet (12.71%), nebulizer (6.91%) and nasal drops (6.45%). Dosage form in case of syrups was mentioned as milliliters (ml) for majority of preparations.

Discussion

A prescription provides an insight into a prescriber’s attitude to the disease being treated and the nature of health care delivery system in the community. Correct diagnosis of a disease and its management with medicines, constitute important aspects of patient care which is even more important in case of pediatric patients. For this it is very prudent to study the prescribing practice in pediatric patients in order to find out lacunae, if any, and suggest

remedial measures to overcome the same. This study has provided a better understanding of the prescribing practices in the hospital.

Table 7: Dosage Forms prescribed

Dosage form	Percentage
Injection	45.96
Syrup	17.86
Tablet	12.71
Nebuliser	6.91
N.drops	6.45
Drops	4.69
Other*	2.15
Powder	1.30
Capsule	0.78
Solution	0.65
Suppository	0.52

*Other includes lotion, mouth paint, ointment, ear drops etc

In the present study a total of 205 patients data were evaluated during 6 month study period. Out of 205 patients, 128 patients were male and 77 were female. The number of male patients was more than the number of female patients. A total of 767 medicines were prescribed to 205 patients. Mean ± SEM of medicines prescribed was 3.74 ±0.07. Mean ± SEM of medicines prescribed for male patients were 3.76 ± 0.10, while for female patients it was 3.69 ± 0.11. The average number of drugs per patient (3.74 ±0.07) was less than to a similar study conducted in (5.26) Nepal [6] and (5.01) Kathmandu Valley. [7]

A high percentage of patients’ i.e.51.21% was prescribed at least one antibiotic which was different from the study done in Netherland [8] i.e. 36%, New Zealand [9] i.e. 60.6%, and Nepal i.e. 93%. It is not possible to draw any firm conclusion since the patients are not matched socio- economically. The morbidity pattern also may not be similar. The prescription of antibiotics was based on mainly clinical judgment without investigation.

Paracetamol was the most frequently prescribed medicine (112 cases) followed by ceftriaxone (81 cases), salbutamol (69 cases) and amikacin (52 cases). Paracetamol was prescribed for approximately 55% of the patients. Antibiotics were used in 162 cases and nine different antibiotics were prescribed. In more than 35% of cases Ceftriaxone was prescribed which was followed by Amikacin 23%.

The parenteral route may be necessary in hospitalized patients as they are admitted in serious conditions requiring increased parenteral antibiotics for faster recovery. But it is more expensive in terms of nursing resources. Disposable syringes are used to administer antibiotics, thus reducing the risk of infection but adding to the cost of treatment.

Inappropriate utilization of antimicrobial agents forced many researchers to evaluate the antimicrobial drugs consumption in order to restrict and control the risk of antibiotic misuse. Several studies were published worldwide to assess this problem.

CONCLUSION

Antibiotic use should be minimized especially the broad spectrum antibiotics. There are no significant prescribing differences between male and female patient groups. There is still scope of improvement in various areas like dosage calculation, proper documentation, prescribing drugs by generic name and from WHOEML for children as far as possible. Development and implementation of Standard Treatment Guidelines (STGs) based on essential drug concept and promoting rational drug therapy will lead to more and more rational prescribing in pediatrics. Periodic prescriptions analysis and effective feedback to clinician should be done based on results to ensure rational prescribing and effective health care management, which will ultimately lead to a better child health. The main challenges in prescription of antibiotics are to achieve a rational choice and appropriate use of antibiotics and to recognize their potential problems. Consequently, physicians must keep a clear understanding of need for microbiological diagnosis, use of antibiotics and make good judgment in clinical situations.

CONFLICT OF INTEREST

None

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REFERENCES

1. Mudasir M, Tariq S, Amjad S. Prescribing Practices in Pediatrics and Drug Utilization Studies Promoting Pediatric Health. *Indo American Journal of Pharmaceutical Sciences*. 2018; 05(08): 8070-8076.
2. Clavenna A, Berti A, Gualandi L, Rossi E, De Rosa M, Bonati M. Drug utilization profile in the Italian pediatric population. *European Journal of Pediatrics*. 2009; 168(2):173-180.
3. Lusini G, Lapi F, Sara B, Vannacci A, Mugelli A, Kragstrup J, Bjerrum L. Antibiotic prescribing in pediatric populations: A comparison between Viareggio, Italy and Funen, Denmark. *European Journal of Public Health*. 2009; 19(4):434-438.
4. Di Paolo ER, Gehri M, Ouedraogo-Ruchet L, Sibailly G, Lutz N, Pannatier A. Outpatient prescriptions practice and writing quality in a pediatric university hospital. *Swiss Medical Weekly*. 2012; 142:w13564.
5. Lin YM, Chen HY, Yung TK, Ho MU, Kuo YT, Chiang YC. Outcomes of pharmacy interventions on pediatric medication prescribing patterns in Taiwan. *International Journal of Experimental and Clinical Medicine*. 2010; 2(4):173-180.
6. Rehana HS, Nagrani MA, Moushumi R. A study on the drug prescribing pattern and use of antimicrobial agents at a tertiary care teaching hospital in eastern Nepal. *Indian Journal of Pharmacology*. 1998;30(3):175-180
7. Palikhe N. Prescribing pattern of antibiotics in paediatric hospitals in Kathmandu valley. *Kathmandu University Medical Journal*. 2004;2(1):6-12.
8. Marlies A, Van H, Klarieke L. Antibiotic utilization for hospitalized paediatric patients. *International Journal of Antimicrobial Agents*. 1998; 10(2):161-164.
9. Jason H, Isobel M. Pediatric prescribing in New Zealand. *New Zealand Family Physician*. 2002; 29(1):14-18.