

RESEARCH ARTICLE

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A Cross-sectional Study on Occurrence of Medication Errors in Outpatient Pediatric Department of Public Sector Hospital, Lahore, Pakistan

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Received: 12 September 2018;

Accepted: 23 November 2018

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Abstract

Background: The knowledge of medication errors is an essential prerequisite for better healthcare delivery. Medication errors are potential errors and impart a significant burden on patient quality of life as well as economic status. **Objectives:** The study was conducted with objective to determine the prevalence and nature of medication errors in pediatric out-patients and also to study their prescribing pattern. **Methods:** A quantitative cross-sectional study was conducted in Outpatient Pediatric Department of Public Sector Hospital, Lahore, Pakistan over a period of one month during which 240 prescriptions were evaluated to identify medication errors and prescribing pattern. Data was collected by using a self-designed data collection tool and analyzed using SPSS version 20. **Results:** Current study evaluated 240 outpatient prescription orders out of which 234 were found to have medication errors. Highest percentage of errors observed in studied population including prescription errors (missed prescriber and patient information) (86.8%), prescribing errors (7.6%) and dispensing errors (3.6%) respectively. Upper Respiratory Tract Infection was the extensive complaint of majority of patients and the drugs of concern were mainly antibiotics, antihistamines, analgesics and anti-inflammatory and expectorants. **Conclusion:** The current detection of medication errors reveals about recurrent basis of prescribing errors in addition to prescription parts errors. These findings emphasizes that prescribers need to work in alliance with pharmacist to improve patient's quality of life in primary care.

Key words: Medication error, Pediatric, Outpatient, Prescription.

INTRODUCTION

Public safety is notably a growing health issue.^[1] A medication error is a preventable incident related with improper medication usage that can be managed through efficacious control system.^[2] In all health care settings the preventable medication errors account to have significant influence on more than 7 million patients with annual cost of USD 21 billion.^[3] An estimated annual death rate of people in United States reported in a recent study in an Institute of Medicine is about 44000 to 98000 as consequence of medication related problems.^[4] Adverse drug event is the major concern frequently observed with medication errors that resulted in a surprisingly increased death rate from 20 to about 200 percent annually in UK from 1990-2000.^[5] Drug is a predominant element in health care and play critical role in life saving. The improper medicine use has severe economical and health burden on society. Most extensively prescribing pattern found to be involved in such errors.^[6] Practice of hand written prescription is usually a significant factor related with occurrence of medication errors in outpatient settings.^[7] Due to lack of e-prescribing and less regulated non-hospital setting procedures, outpatients are more vulnerable to medication errors.

A considerable approach has been entitled to eradicate these errors and associated ADEs in adults but comparatively, it is hard to find published data about pediatric affairs.^[8] In pediatric ambulatory patients drug use is one of the distinctive problem in assessment and regulation of disease because

therapeutics dosage regimen is burdensome.^[6] Non provision of dosing on weight basis, poor communication and immature renal and hepatic physiology are the factors which make pediatric population more prone to these errors.^[9] A large number of health care settings in Pakistan are not equipped with appropriate e-prescribing system and are also burdened with huge patient flow thus; accordingly the current study was designed to look for occurrence of medication errors in prescription orders of ambulatory setting in Pakistan.

MATERIALS AND METHODS

A quantitative cross-sectional study was conducted in outpatient Pediatric Department of Public Sector Hospital Lahore, Pakistan. The data of 240 prescription order of patients up to 14 years of age over a period of one month from December, 2017 to January, 2018 was collected. Patients were approached by convenient sampling technique and their prescriptions were noted on a self-designed study questionnaire. Study questionnaire comprised of three sections. In Section I demographic characters of participants were noted, in section II we investigated about prescriber and patient information and section III gathers information about prescribing (drug name, route of administration, dose and frequency) and dispensing errors. BNF for Children 2014 was used for the reference to document. The data was analyzed by using SPSS version 20.

Inclusion and Exclusion Criteria

All the children of age up to 14 years were included in this study.

The prescription with 2 or more drugs.

All the patients who visited for the first time.

Ethical Approval

This study was approved by the research and ethics committee of department of Pharmaceutical Sciences, Superior University Lahore and approval was also taken from Medical Superintendent of hospital. A verbal and written consent was taken from the parents or guardian of the patient.

RESULTS

In the current study a total of 274 patients were approached out of which 240 showed willingness to participate in the study with a response rate of 87.6%. Study results revealed that maximum number of patients (33.3%) were in between age categories of 4-6 years followed by 1-3 years (29.0%), 7-11 years (25.3%) and 12-14 years (12.0%) respectively (Figure 1). Regarding gender distribution female ratio was slightly higher (50.4%) than the males. A large number of the pediatric ambulatory patient were with weight 15-22kg (35.0%) followed by 7-14kg (34.6%), 23-30kg (19.2%) and 31-38kg (11.3%) respectively (Table 1).

Substantial drugs prescribed in concerned population were antibiotics 218 (90.8%) followed by anti-cold formulations 199 (81.7%), analgesics 154 (64.2%), vitamin supplements 39 (16.3%) and anti-histaminic 14 (5.8%) respectively (Table 2) (Figure 2).

Out of total 240 prescriptions 234 (97.5%) prescriptions had at least one type of medication error. In context to prescriber and patient information error doctors name was missing on 15 (6.3%), date in 23 (9.6%), patients name in 3 (1.3%), patients age in 39 (16.3%) and weight was missing in 67 (27.9%) prescriptions. Similarly, in terms of prescribing errors drugs name was wrong in 17(7.5%) and route of administration was wrong in 43 (17.9%) prescriptions. Dose and frequency of dose was high and low in 4 (1.7%) and 5 (2.1%) patients respectively (Table 3) (Figure 3).

DISCUSSION

A medication error is any event associated with medication that can be prevented by use of effective control system. Medication error can result

Gender	N (%)
Male	119 (49.6)
Female	121 (50.4)
Total	240 (100)

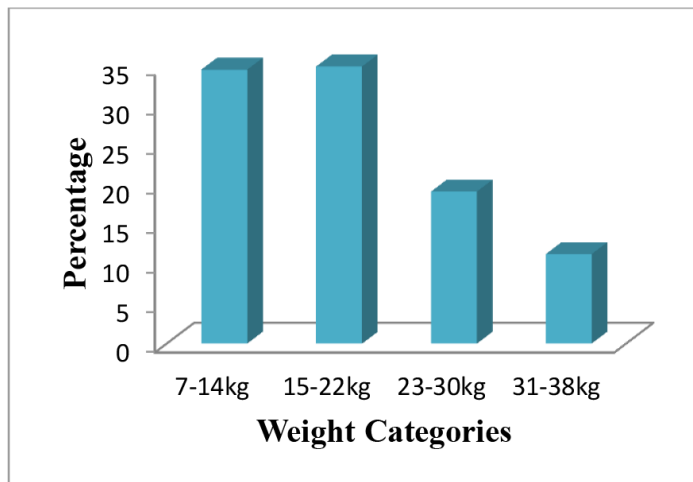


Figure 2: Distribution of patients according to the weight categories.

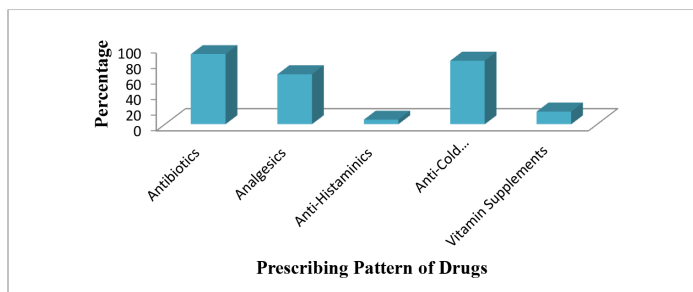


Figure 3: Prescribing framework of Drugs.

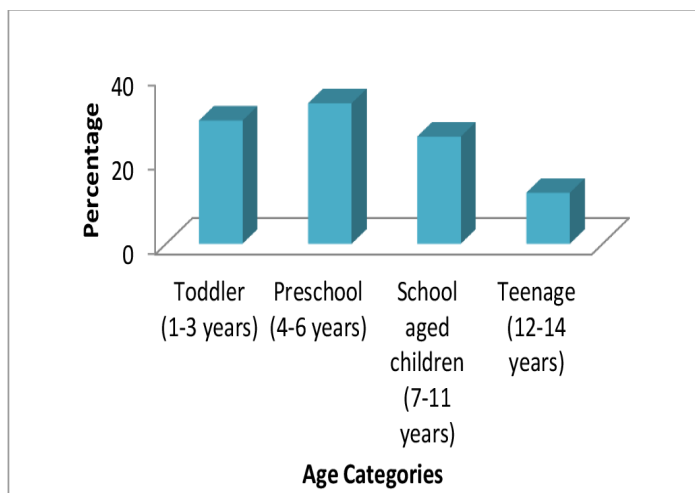


Figure 1: Distribution of patients according to the age group.

Types of Medication errors	Frequency of errors	Percentage (%)
Prescriber and Patient Information		
Doctor's name		
Date	15	6.3
Patient's name	23	9.6
Patient's age	3	1.3
Missing patient's weight	39	16.3
	67	27.9
Prescribing Errors		
Wrong drug's name	17	7.5
Route of administration	43	17.9
Dose error		
Overdose	4	1.7
Underdose	5	2.1
Frequency error		
High frequency	4	1.7
Low frequency	5	2.1
Dispensing Error:		
Incomplete or no drug information	9	3.7

in adverse drug reactions (ADRs), drug-drug interactions, lack of efficacy, suboptimal patient adherence and poor quality of life. In health care settings medication error is a recurrent cause of mortality and morbidity.^[2,10] They represent a severe social and health problem with important economic consequences.^[11] Medication errors exist in both developed and developing countries but in developing countries the condition is worse and need to be addressed. The current study looked for detection of the occurrence of medication errors among children. Results of study revealed much high frequency (97.5%) of errors in studied population. These results are in accordance with the findings from study reported from other parts of Pakistan where the rate of prevalence of errors is also high (98%).^[12] Similar to what is reported from Pakistan, high frequency of errors is also reported around the globe where in developing countries such as India, Nepal and Iran.^[13-15] Contrary to the recent finding, in the developed countries such as USA, Canada, Australia and New York the occurrence of medication errors is comparatively low (70%).^[16-19] A possible major reason that can be attributed to this difference is their advanced health care system, other factors that can also be considered responsible for this difference can be demographic variation of the study population, study location and as well as the study tool used for data collection.^[20] Besides of medication related errors, incomplete prescription parts majorly prescriber and patient information presented with high percentage of errors that is in accordance with study of other regions of country.^[21] The slot for errors appears to be a greater extent owing to availability of lesser number of licensed drugs specifically tested for children and a deprivation of appropriate medication strengths in contrast to the adult community.^[22] Many variables for instance, weight, body surface area, age and health status of patients are basis to calculate sufficient Pediatric dosages.^[22,23] 40% of the errors are associated with care givers in dosing liquid medications in children.^[24] Unintended toxic effects because of overdosing and insufficient therapeutic effects are related with under dosing of antibiotics in PAEDS.^[25] “Five rights” of medication administration have crucial role to lessen the incidence of medication errors “the right drug, for the right patient, at the right time, in the right dosage, by the right route”.^[26] The necessity to initiate rational and empirical protocols, physician need to work in alliance with clinical pharmacist to limit medication over prescribing.^[27] Significant training must be given to future prescribers and other healthcare professionals in college and universities together with awareness programs relevant to such error prevalence and harmful impact in society. Pharmacovigilance centers must be reinforced to notify healthcare professionals by revealing information about the numerous drug-related issues. This manifests that subsequent prevention can be attained to identify errors by pharmacist.

CONCLUSION

It comes to an end that the medication errors were frequently observed in pediatric ambulatory setting. Incorrect prescription writing and dispensing mainly attributed to insufficient time by prescribers to calculate appropriate doses in accordance with child’s physiology. In spite of the fact that prescribing errors are familiar, prescription elements need to be addressed. Acceptable regulations and computerized prescription are required to minimize these errors.

ACKNOWLEDGEMENT

We acknowledge the great help from the staff of Outpatient Pediatric Department of Mayo Hospital, Lahore, Pakistan and also appreciate the participation of the patients.

CONFLICT OF INTEREST

The authors proclaim no conflicts of interest.

ABBREVIATIONS

e-Prescription: Electronic Prescription; **ADEs:** Adverse Drug Events; **ADRS:** Adverse Drug Reactions; **PAEDS:** *Paediatric Active Enhanced Disease Surveillance*; **URTIs:** Upper Respiratory Tract Infections.

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Cite this article as: Jamshaid A, Bakar MA, Komal S, Imran M, Muhammad Q, Hassan GA. A Cross-sectional Study on Occurrence of Medication Errors in Outpatient Pediatric Department of Public Sector Hospital, Lahore, Pakistan. *J Pharm Pract Community Med*. 2018;4(4):207-10.