International Journal of Research in Medical Sciences
Suwitha S et al. Int J Res Med Sci. 2023 May;11(5):1775-1779
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20231353

Original Research Article

A study of drug utilization pattern using WHO prescribing indicators in pediatric patients

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Received: 15 March 2023
Revised: 14 April 2023
Accepted: 15 April 2023

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ABSTRACT

Background: The study aimed to get drug utilization pattern using WHO prescribing indicators in pediatric patients.
Methods: It was an observational prospective study carried out in pediatric in-patients with a sample size of 280 patients based on inclusion, and exclusion criteria for a period of 6 months. The study data were collected using patient case record and analysis was done.
Results: Out of 280 patients data collected, majority of patients were in the gender male category 168 (60%) and many were from the age group of early childhood (1-5 years) 126 (45%). Respiratory tract infections were the major diagnosis made among the sample size. The drug class commonly prescribed were oral antibiotics 261 (28.38%). The average number of drugs per prescription were 3.28%. Among the total number of prescription percentage of drugs prescribed by generic name and antibiotics were 2.7%, 76.07%. Percentage of patients prescribed with injection were 79.28%.
Conclusions: This study highlights WHO prescribing core indicators in evaluating the usage of rational prescription. It helps in reinforcing rational prescribing practices and increases awareness among physicians and medical students. Irrational prescriptions may result in harmful events. A rational prescription should follow the standard treatment guidelines of WHO. The assessment of these indicators can also help us to decrease the cost burden on the patient. Continuous education with focus on rational drug usage and evidence-based medicine can further increase the understanding and improves health care policies.

Keywords: Antibiotics, Core indicators, Pediatrics, Respiratory tract infections, Utilization pattern

INTRODUCTION

DUR is an ongoing, systematic process designed to maintain the appropriate and effective use of medications. It involves a comprehensive review of a patient's medication and health history before, during, and after dispensing in order to attempt to achieve appropriate therapeutic decision-making and positive patient outcomes.[1] The principal aim of drug utilization research is to facilitate the rational use of drugs in populations for an individual case, the rational use of a medicine implies the tradition of a well-proved medicine at an optimal dose, together with the correct information, at an affordable price. Without knowledge of how medicines are being prescribed and used, it's delicate to initiate a discussion on rational medicine use or to suggest measures to ameliorate defining habits.

Medicine application exploration can increase our understanding of how medicines are being used as follows:

i) It can be used to estimate the figures of cases exposed to specified medicines within a given time period. Similar estimates may either relate to all medicine users, anyhow of when they started to use the medicine (frequency), or concentrate on cases who started to use the medicine within the named period (prevalence). ii) It can describe

the extent of use at a certain moment and/ or in a certain area (e.g. in a country, region, community or sanatorium). Similar descriptions are most meaningful when they form part of a nonstop evaluation system, i.e. when the patterns are followed over time and trends in medicine use can be discerned. iii) Experimenters can estimate (e.g. on the base of epidemiological data on a complaint) to what extent medicines are duly used, overused or underused. iv) It can determine the pattern or profile of medicine use and the extent to which indispensable medicines are being used to treat particular conditions. v) It can be used to compare the observed patterns of medicine use for the treatment of a certain complaint with current recommendations or guidelines. vi) It can be used in the operation of quality pointers to patterns of medicine application.[2]

The World Health Organization (WHO) core indicators helps to improve the prescribing patterns thus promoting the rational use of drugs in a healthcare facility.

The medicine use pointers would generally be measured within a defined geographic or executive area, either to describe medicine use at a given point in time or to cover changes over time.

All the data demanded to measure the core pointers are collected from medical records or direct compliances at individual health installations. Core drug use indicators are the minimum set of measures to be calculated during a single drug use indicators survey.[3]

Drug utilization studies which are conducted periodically can favor the auditing provides feedback to the prescribers, pave way for critical analysis of the health policies and make recommendations.[4]

Aim and objectives

The study aims to get drug utilization pattern using WHO prescribing indicators in pediatric patients..

METHODS

Study design

It was a prospective observational study.

Study place

The study was conducted in Apollo children's hospital, in patient department, Tamil Nadu, which is an 80 bedded multi-specialty child care hospital located in urban south India.

Study period

The duration of study was 6 months (August 2022 to January 2023).

Study population

Sample size of 280 has been collected during the period of study duration.

Source of data

Patient data concerning study was obtained from patient case records.

Subject recruitment was based on inclusion and exclusion criteria.

Inclusion criteria

All inpatients of the pediatric department with regulation up to 12 years prescribed with a minimum of 1 drug.

Exclusion criteria

Patients of either aged >12 years. Patients of outpatient department. Patients who are not willing to co-operate.

Study procedure

Suitably designed data collection form was used to collect the specified data including patient demographic, laboratory data, drug remedy, and other applicable information's. Patient's demographic data contains information of patient's age, sex, date of admission and discharge along with chief complaints, diagnosis, history of a patients, general and systemic examinations, details of prescribed drugs, and their routes administered.

Prescribing indicators

The WHO core prescribing indicators were used for evaluating rationality of prescriptions, which are as follows:[2]

Average number of drugs prescribed per encounter: It was calculated by dividing total number of drug products prescribed by number of encounters surveyed.

Percentage of drugs prescribed by generic name: It was calculated by dividing number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100.

Percentage of encounters with an antibiotic prescribed: It was calculated by dividing number of patient encounters in which an antibiotic was prescribed by total number of encounters surveyed, multiplied by 100.

Percentage of encounters with an injection prescribed: It was calculated by dividing number of patient encounters in which an injection was prescribed by total number of encounters surveyed, multiplied by 100.

Percentage of drugs prescribed from Hospital formulary: It was calculated by dividing number of products prescribed, which are in hospital formulary by the total number of drugs prescribed, multiplied by 100.

Statistical method

A simple percentage calculation was conducted in order to derive conclusion out of the study. Tables, figures were generated using Microsoft word (2010).

RESULTS

The below figure elucidates gender wise distribution out of 280 patients, 168 (60%) were male and 112 (40%) were female (Figure 1).

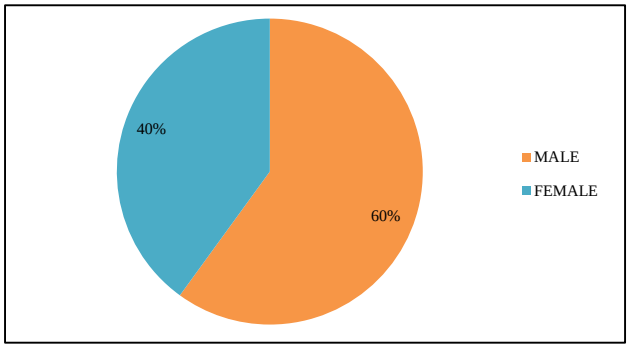

Figure 1: Gender wise distribution.

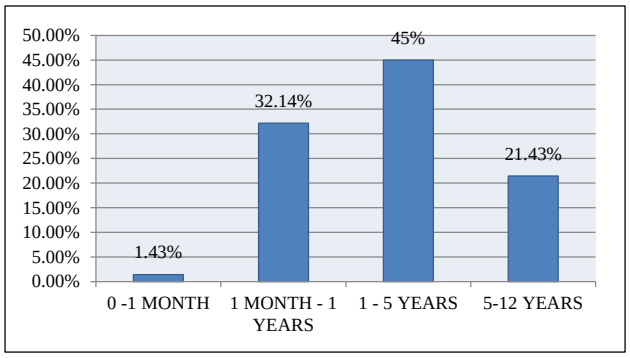

Figure 2: Age wise distribution.

Figure 2 shows that maximum number of patients in the study were between the age group of 1-5 years 126 (45%) Followed by 90 (32.14%) 1 month-1 year old and 60 (21.43%) 5-12 years old, and 4 (1.43%) 0-1 month old.

Table 1: Diagnosis wise distribution.

Diagnosis	Total	Percentage
Respiratory tract infections	103	36.80
Fever	87	31.07
Acute gastro enteritis	33	11.78
Seizures	27	9.64
Urinary tract infections	9	3.21
Others	21	7.50

Table 2: Category wise distribution

Category	Total	Percentage
Antibiotics	261	28.38
Analgesic, antipyretic and NSAID's	159	17.28
Proton pump inhibitors	119	12.93
Anti-emetics	70	7.60
Anti-histamines	60	6.52
Nasal decongestants	57	6.19
Bronchodilators	63	6.84
Pre and probiotics	26	2.82
Anti-epileptic	31	3.4
Anti-viral	27	2.94
Corticosteroids	13	1.41
Multivitamins	22	2.39
Laxative	7	0.76
Others	5	0.54

Table 1 describe the diagnostic pattern of the diseases observed among 280 pediatric patients. Respiratory tract infection was found to be the highest in number 103 (36.80%) followed by Fever 87 (31.07%) acute gastro enteritis 33 (11.78%), seizure 27 (9.64%), urinary tract infection 9 (3.21%) and other diseases 21 (7.50%).

Table 2 describes a total of 920 drugs prescribed among 280 patients. The drug class commonly prescribed are oral antibiotics 261 (28.38%) followed by analgesic, anti-pyretic, NSAID's 159 (17.28%), proton pump inhibitors 119 (12.93%), anti-emetics 70 (7.60%), anti-histamines 60 (6.52%), nasal decongestants 57 (6.19%), bronchodilators 63 (6.84%), pre and probiotics 26 (2.82%), anti- epileptic 31 (3.4%), anti-viral 27 (2.94%), corticosteroids 13 (1.41%), multivitamins 22 (2.39%), laxative 7 (0.76%) and other categories 5 (0.54%).

Table 3: World health organization prescribing indicators in the current study.

Prescribing indicators	Total drugs	Percentage	Standard value[5] (%)
Drugs per encounter	920	3.28%	1.6-1.8
Drugs prescribed by generic name	27	2.7%	100
Encounters with antibiotics	213	76.07%	20.0-26.8
Encounters with injections	222	79.28%	13.4-24.1
Drugs from hospital formulary	920	100%	100

Table 3 elucidates that 280 prescriptions were analyzed to describe the current prescribing pattern in the hospital and drug utilization trend. The average number of drugs per prescription were 3.28%. Percentage of drugs

prescribed using generic name were 2.7%. Antibiotics were frequently prescribed: percentage of encounters with antibiotics were 76.07%. Percentage of encounters with an injection prescribed were 79.28%. The drugs prescribed from the hospital formulary were only 100%.

DISCUSSION

For improving rational drug use it's important to know ho w drugs are being prescribed and used, so that we can initiate discussion and suggest measures to modify the prescribing habits.[6-9] In the present study, out of 280 patients, 168 (60%) were male and 112 (40%) were female patients which were similar to the studies conducted by Venkateswaramurthy et al.[10] The maximum numbers of prescription analyzed were 126 (45%) between age group of 1-5 years the result matched with a study done by Sharma et al and Rahul et al.[11,12] Majority of the paediatric patients were suffering from respiratory tract infection 103 (36.80%) and fever 87 (31.07%) similar to the studies conducted by Sharma et al.[11] A total of 920 drugs were prescribed and most frequently prescribed drug were antibiotics 261 (28.38%) which is being matched with the results of study done by Rahul et al and Chandelkar et al.[11,13] The other classes follows antibiotics in our study were followed by analgesic, anti-pyretic/NSAID'S 159 (17.28%), proton pump inhibitors 119 (12.93%), anti-emetics 70 (7.60%), anti-histamines 60 (6.52%), nasal decongestants 57 (6.19%), bronchodilators 63 (6.84%), pre and probiotics 26 (2.82%), anti- epileptic 31 (3.4%), anti-viral 27 (2.94%), corticosteroids 13 (1.41%), multivitamins 22 (2.39%), laxative 7 (0.76%) and others 5 (0.54%).

Prescription pattern studies are required to ensure safe and effective medication usage at all stages of therapy, which aids in identifying inappropriate types of prescribing such as polypharmacy and irrational use of antimicrobials. As per WHO core prescribing indicators, average number of drugs per encounter was found to be 3.28%. Which is higher than the standard value of 1.6-1.8 and less when compared to a study done by Rahul et al.[12] and Arthi et al.[14] Clinical pharmacist should play a vital role in educating hospitals staff about drug utilization pattern and should monitor drug usage for inappropriate drug usage (polypharmacy).[6]

Percentage of drugs by generic name were only 2.7%. Which was lower than the standard value of 100%. When compared with the study done by Hussain et al. The study also reports high percentage of drugs prescribed by generic name (10.05%).[5] Percentage of encounter prescribed antibiotic were 76.07% according to our study which was higher than WHO standard value 20-26.8%. Though it is higher than Sharma et al, lower than Rahul et al.[12] The percentage of encounter prescribed with injection 79.28% which was higher than the standard value 13.4-24.1%. The percentage of drugs prescribed from hospital formulary during the study period was 100% which is within the range of standard value 100%.

Limitations were that only WHO core indicators has been discussed in this study.

CONCLUSION

The study aimed to get drug utilization pattern using WHO prescribing indicators in pediatric patients. Most of the patients were prescribed with antimicrobial drugs in our study. The most common indication was respiratory tract infection followed by fever. Maximum numbers of patients were between the age group of 1-5 years old. This study highlights WHO prescribing core indicators in evaluating the usage of rational prescription. It helps in reinforcing rational prescribing practices and increases awareness among physicians and medical students. Irrational prescriptions may result in harmful events. A rational prescription should follow the standard treatment guidelines of WHO. The assessment of these indicators can also help us to decrease the cost burden on the patient. Continuous education with focus on rational drug usage and evidence-based medicine can further increase the understanding and improves health care policies. Now a days regular clinical auditing is done by clinical pharmacist to assess the rationality of prescriptions and also to avoid antibiotic resistance in patients.

ACKNOWLEDGEMENTS

We would like to thank Apollo Children's Hospital and its department of pharmacology for helping us with the data required for the study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee, Apollo Children's Hospital, Chennai

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Cite this article as: Suwitha S, Margrat BCF, Priya A, Yadav KAC. A study of drug utilization pattern using WHO prescribing indicators in pediatric patients. Int J Res Med Sci 2023;11:1775-9.