Original Research Article

Prescribing pattern of antibiotics in pediatric department of a tertiary care teaching hospital

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ABSTRACT

Background: Prescription is an order from doctor for medicine. Rational use of medicines requires that "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community". Irrational use of medicines is a major problem worldwide. This leads to serious morbidity and mortality also leads to reduction in the quality of treatment due to antibiotic resistance. Evaluation of prescribing pattern will help in minimizing adverse drug reactions, resistance among children. Also help to know the attitude of the physicians towards prescribing. Aim of the present study was to evaluate the prescription pattern of antibiotics in paediatric inpatients of Hassan institute of Medical Sciences.

Methods: A prospective study, conducted among 110 patients below the age of 18 years and being treated with antibiotics were included in our study. The results were analyzed using descriptive statistics.

Results: Out of 110 patients, female (58) and male (52) are enrolled in the study from inpatient paediatrics department, majority of patients belonged to age group of 0-5 years (74%), respiratory tract infections 29 (35%) , gastrointestinal infections 26 (22%) and central nervous system in 9 (11%). Out of 227 antimicrobial agent, about 83.48% were cephalosporins, followed by ciprofloxicin (33.94%), amoxicillin (32.11%), and amikacin (6.42%).

Conclusions: Cephalosporins (ceftriaxone) were most commonly used antibiotic, which covers gram positive, gram negative and anaerobic organism.

Keywords: Antibiotics, Cephalosporins, Prescribing pattern, Pediatrics, Rationality

INTRODUCTION

Antibiotics are the substances that destroy or inhibit the growth of other microorganisms and are used in the treatment of external or internal infections.[1] Antibiotics are among the most commonly prescribed drugs in paediatrics for the treatment of illness like fever, urinary tract infection, gastroenteritis, skin infections, lower respiratory tract infection, upper respiratory tract infection.[2] Because of lack of uniformity in drug prescribing and the emergence of antibiotic resistance,

monitoring and control of antibiotic use are of growing concern and strict antibiotic policies should be warranted.[3] Antimicrobial resistance substantially raises already-rising health care costs and increases patient morbidity and mortality.[4]

The paediatric population comprises of 20-25 percent of the total world population, and numerous acute and chronic diseases can effect this sub population. Premature neonates have poorly developed organ functions and are at highest risk of eliciting unexpected toxicity or poor

clinical response from sub optimal dosage regimens of drug usage.[5]

Physicians are the health professionals who are primarily responsible for treatment and to know about their prescribing practices can contribute to the achievement of initiatives and regulations.[7] The International Network for the rational use of drugs generated indicators in three main drug use areas viz prescribing, patient care and drug systems.[8] Prescription pattern analysis oversees the observance of standards of medical treatment at all levels of the healthcare delivery system. The study of prescribing patterns is a part of the medical audit and seeks to monitor, evaluate, and if necessary, suggest modifications in prescribing practices to make medical care rational and cost-effective.[8]

Evaluation of prescribing pattern will also help in minimizing adverse drug reactions as children are more susceptible.[9] In order to be rational, use of a drug must be effective, safe, prescribed for the proper therapeutic indication and the correct dosage in an appropriate formulation.[10]

Need for the study is seeks to monitor, evaluate, and if necessary, suggest modifications in prescribing practices to make medical care rational.

METHODS

This study was a hospital based prospective and observational study, conducted at Hassan Institute of Medical Sciences, Hassan, over a period of 3 months (September 2018 to November 2018).

110 patients' prescriptions with age of 0 to 18 years were selected for the analysis of prescription pattern. The relevant information's were recorded from the patients' case sheet which consists of details like patient demographics, general physical examination, laboratory data.

The following WHO prescribing indicators were used in this study and were calculated using standard methods.[11]

- Average number of drugs prescribed per encounter.
- Percentage of drugs prescribed by generic name.
- Percentage of patient encounters with an antibiotic prescribed.
- Percentage of drugs prescribed from the national EDL (Essential drug list) or the facility's formulary.
- Average duration of stay.

Besides these, age and sex distribution, the body weight and diagnosis status of patient, most commonly prescribed drugs other than antibiotics drugs per prescription were also taken into consideration.

Inclusion criteria

Patients of either sex aged 0-18 years, patients admitted to the department of paediatrics, patient who are willing to give consent.

Exclusion criteria

Patients aged >18 years of age, patients who are not willing to consent, unconscious patients. (e.g. continuous coma state).

Consent was collected by using self-designed patient consent form. Consent form made in two languages and consent of each patient/guardian was taken. The study was approved by the Institutional Ethical Committee of Hassan institute of Medical sciences, Hassan.

Data analysis

The prescriptions were analyzed for the percentage of drugs prescribed by generic name, total number of drugs to each patient, antimicrobials prescribed from Essential drug list, average duration of hospital stay, and descriptive analysis done. All the documented data were evaluated by applying different statistical analysis like mean, standard deviation, correlation. This data was analyzed by using Microsoft Excel. The results were presented as mean and percentages.

RESULTS

Age distribution of patients

Out of 110 patients, 58 female 52 males are enrolled in the study from inpatient paediatrics department, Majority of patients 74% belonged to age group of 0-5 years.
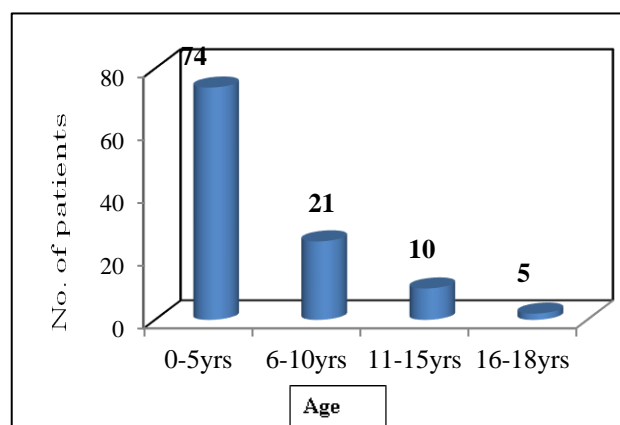

Figure 1: Age distribution of patients (n=110).

Distribution of infections in paediatric patients

Out of 110 patients enrolled in the study, it was observed that respiratory tract infections in 35%, followed by gastrointestinal infections 22%, and central nervous system in 11%, blood disorder in 15%, nephritic

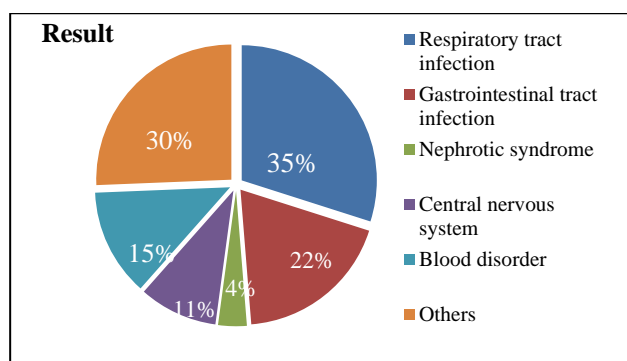syndrome in 4%, others are like skin infection, urinary tract infection.

Figure 2: Distribution of infections in pediatric patients.

Distribution of antimicrobial agents

Out of 227 antimicrobial agent prescribed, about 83.48% were cephalosporins, followed by ciprofloxicin 33.94% and beta lactamase inhibitors amoxicillin 32.11%. and amino glycoside antibiotics amikacin 6.42%.
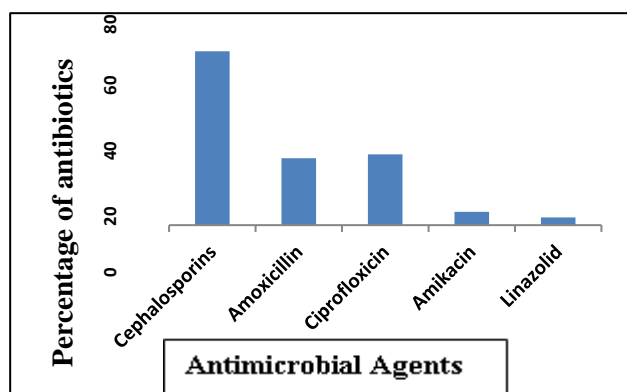

Figure 3: Distribution of antimicrobial agents.

Table 1: Variables as per the WHO indicators.

Variable	Values
Total number of drugs/patient	3-7
Average number of antimicrobials/encounter	3.5
Antimicrobials prescribed by Generic name	30.90
Antimicrobials prescribed from Essential drug list	90
Average duration of stay	5 days

The WHO prescribing parameters such as average number of drugs per patient (3-7). Out of 3.5 antibiotics prescribed, 30.9% drugs were prescribed by generic name, almost 90% were included in essential drug list. The average duration of stay was 5 days.

DISCUSSION

A prescription by a doctor may be taken as a reflection of physician's attitude to the disease and the role of drug in its treatment.[12] Lists of essential medicines also guide the procurement and supply of medicines in the public sector, schemes that reimburse medicine costs, medicine donations, and local medicine production, and, furthermore, are widely used as information and education tools by health professionals. The model list serves as a baseline for further modification (addition and deletion of new medicines), correct dosage strength, and form depending upon the national priority and available evidence.[13]

In present study, majority of the patients belonged to the age group of less than 5 years, because these group of people have less immunity and are more prone to infections. Arulmoli et al, where they observed that the majority of the patients belonged to the age group 1-5 years (45%).[14]

Males and female population was almost similar in our study, there is no more predominance in the gender under taking treatment. Out of 110 patients enrolled in the study, it was observed that respiratory tract infections in 35%, more respiratory tract infections were reported in our study as the study was conducted during winter season.

Out of 227 antimicrobial agent prescribed, major class was cephalosporin's were 83.48%, followed by ciprofloxicin 33.94% and beta lactamase inhibitors amoxicillin 32.11% and amino glycoside antibiotics amikacin 6.42%. The study conducted by Kanish et al found that the most common antimicrobial agents prescribed were cephalosporins followed by amino glycosides, in cephalosporins the most common was ceftriaxone (51.79%) antibiotic which covers gram positive, gram negative and anaerobic organism.[15]

A study conducted by Rybak et al, justifies the use of antibacterial combination therapy in treatment of infections.[16] The most preferred dosage form was injectables. The injectables were prescribed more because of the inpatient history. Injectables are given more because for urgent control of infections and to minimize morbidity as compared to oral route. Another study conducted by Ramesh et al on analysis of antimicrobial prescriptions in pediatric patients in a teaching hospital had proven that injection were the commonest route of administration by 58.25% followed by oral rout 38.20%.[17]

Present study highlights the need of rational drug use practices like prescribing by generics and drugs under essential drug list. Generic prescribing helps the hospital pharmacy to have a better inventory control. Confusion among the pharmacists while dispensing can also be reduced, when prescribed by generic names. Moreover, generic drugs are more cost-effective than the branded

ones.[18] However, in the present study, 30.9 % drugs were written in generic form.

The essential medicines should be the first choice during medical practice. Finally, they should take care of their clients, the patients, by spending some time with them explaining the appropriate use of prescribed medicines. The medical practitioners need to keep themselves updated through attending seminars, conferences, and other continuing professional development programs.

CONCLUSION

The study measured the prescription pattern of paediatric patients at Hassan of Karnataka using the WHO core drug prescribing indicators. The results showed that the average number of drugs prescribed per encounter and the percentage of encounters with injection were within the optimal value.

However, the percentage of encounters with antibiotics was very much higher and the percentage of drugs prescribed from the EDL was optimal level. On the other hand, there is no trend to prescribe drug by generic name. It was recommend that physicians need continuous education about rational prescribing of antibiotics and motivation to prescribe drugs by generic name. Clear and comprehensive rules should be formulated and implemented by the government to ensure rational prescribing.

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