STUDY ON PRESCRIBING PATTERN OF ANTIBIOTICS IN PEDIATRIC OUTPATIENTS IN SOUTHERN INDIA

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ABSTRACT
Background: Children constitute the major part of our society and cannot be neglected. They tend to suffer more illness compared with adults and elderly. Most of their illness is treated using antibiotics. Hence, it is essential that the antibiotic prescribing pattern to be evaluated periodically. Aim and Objective: To evaluate the pattern of prescribing antibiotics in Pediatric outpatients in Southern India. Materials and Methods: A period of three months study was carried out and 150 prescriptions of pediatric patients were collected from different clinics and hospitals at Hyderabad, India. A descriptive statistical analysis of the data was done. Results: A total of 150 prescriptions were collected. Most of them were between 1-7 years of age. Most of the antibiotics prescribed were in the oral dosage form and 93.54% antibiotics were prescribed under their brand names. 1% of antibiotics were administered once in a day. Most of the antibiotics were prescribed for a period of 3 days. Conclusion: Antibiotic prescribing in children is somewhat high in Hyderabad. Aminoglycoside and Chloramphenicol were least prescribed. This may be considered as an effort to improve the quality of health care. On the other hand polypharmacy is seen which should be avoided. Rational use of drugs and knowledge about guidelines for treatment and prevention of common diseases in pediatric population through education is recommended.

Keywords: Pediatric, prescribing pattern, antibiotics, generic names, polypharmacy.

INTRODUCTION
Pediatrics is the branch of medicines dealing with the development, diseases and disorders of children [1]. A medical practitioner who specializes in this area is known as pediatrician. Pediatrics is concerned with the health of infants, children and adolescents, their growth and development, and their opportunity to achieve full potential as adults. The most commonly prescribed drugs among pediatrics are antibiotics. Resistance developed due to the irrational, use of antibiotics is a global public health problem [2]. Children have high rates of minor infection and due to their increased susceptibility to serious bacterial infection; they are frequently prescribed with antibiotics. As per the WHO, rational use of drugs 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 [3].

The use of antibiotic prophylaxis has been shown to prevent post-surgical wound infection. Aseptic techniques alone could decrease but do not completely eliminate bacterial contamination of the surgical field. Prescription pattern reflects health professional attitude toward the disease and role of drugs in its treatment. Appropriate drug utilization studies are needed for evaluating proper utilization of drugs for efficacy, safety, convenience and economic aspects [4]. Antibiotics receive the special attention of the various classes of drugs as more money is spent on them than many other drugs. In view of this, it is important to do study the pattern of prescribing in pediatric patients on continuous bases [5]. Some of the reasons for this lack of testing are small financial benefits to the pharmaceutical companies, 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 [6].

METHODOLOGY
Study Design
In different clinics and hospitals of Hyderabad a retrospective study was undertaken. The study was carried out for a period of three months from December 2018 to February 2019. A total of 150 pediatric prescriptions were collected from different clinics and hospitals at Hyderabad.

Identification and classification of Study Population
The study includes the data collected from the prescriptions of pediatric patients of age group up to 21 years of age. These prescriptions were categories into 4 groups for analyzing purpose.

- Newborn Infants (0-1 year)
- Preschool Children (1-7 year)
- School Children (7-14 year)
- Adolescents (14-21 year)

Sampling Method
To determine the prescribing pattern, a basic indicator of drugs was selected. The information of patient characteristics (gender, age and disease), drugs prescribed (dosage form, dose, nature of drug, frequency of administration, route of administration), antibiotics used (type of antibiotics and their origin), polypharmacy and economic cost of the drug data were collected.

Study criteria
Inclusion criteria
- Outpatients of either sex between the age group of 0-21 years
- Prescriptions containing antibiotics
- Outpatients who were willing to consent

Exclusion criteria
- Pediatric patients from neonatal intensive care unit
- Outpatients above the age of 21 years
- Patients suffering from non-infective diseases
- Outpatients who were not willing to consent

Statistical Analysis
The data obtained was statistically analyzed for all the above parameters. The results obtained were represented in numbers, percentage and graphs using MS Excel. They were computed using pie chart, bar diagram and in tabular form.
Results

Gender wise distribution
Totally, 150 pediatric prescriptions were collected on a random basis and analyzed. Out of 150 prescriptions, 78 (52%) were found to be prescriptions of male patients while 72 (48%) were prescriptions of the female patients. Figure 1 depicts the above data.

Figure 1: Percentage of male and female pediatric prescriptions.

Age wise distribution
After analysis of 150 prescriptions, 50 (33.33%) patients were found to be under the age category 0-1, 60 (40%) patients under the category 1-7, 34 (22.66%) patients under the category 7-14 and 6 (4%) patients under the category 14-21. These details were shown in Figure 2.

Figure 2: Percentage of patients under different age groups

Routes of Administration
In 150 prescriptions, 155 antibiotics were prescribed in total. The maximum number of antibiotics were administered through the oral route i.e. 122 (78.70%), 13 (8.38%) of antibiotics administered were injectable, 13 (8.38%) were ophthalmic preparations, 4 (2.58%) were topical in nature whereas 3 (1.93%) of the total antibiotics prescribed were administered through other routes like optic, nasal, etc. Figure 3 illustrates the above details in a graphical fashion.

Figure 3: Percentage of antibiotics prescribed under different routes of administration.

Dosage forms
The antibiotics prescribed in 150 prescriptions included various types of dosage forms. Highest number of antibiotics was prescribed as syrups i.e. 83 followed by tablets i.e. 25. The least number of antibiotics were prescribed as ointments i.e. 1. Various other dosage forms present in the data were suspensions, drops, injections, creams, granules and capsules. Figure 4 illustrates the details given above.

Figure 4: Number of dosage forms of antibiotics prescribed for pediatric patient

Frequency of administration of antibiotics
In our study, 20 antibiotics were instructed to be taken by the patients one time in a day, 98 antibiotics were to be taken twice in a day, 30 antibiotics were to be taken 3 times in a day and only 2 antibiotics were administered 4 times a day. Figure 5 depict the frequency of administration of antibiotics that were prescribed to the pediatric population under study.

Figure 5: Frequency of administration of antibiotics in pediatric patients

Generic and Brand name
Out of the 150 prescriptions, 94% of antibiotics were prescribed under their brand names, whereas only 6% of antibiotics were prescribed under their generic names. Figure 6 depicts the number and percentage of the mentioned data.

Figure 6: Percentage of antibiotics prescribed on their brand/generic name
Class of antibiotics

Different classes of antibiotics were prescribed to the pediatric population to treat various diseases. 43 (27.74%) of the antibiotics were cephalosporins, 38 (24.51%) were penicillins, 29 (18.70%) fluoroquinolones, 26 (16.77%) macrolides, 6 (3.87%) glycopeptides, 6 (3.87%) azoles, 5 (3.22%) aminoglycosides, 1 (0.64%) chloramphenicol and 1 (0.64%) phosphonic acid. Figure 7 depict the above data.

DISCUSSION

Antibiotics represent one of the most commonly used drugs in the society. Majority of childhood illnesses observed in the pediatric population are caused by viruses which do not require antibiotics for their treatment. So, excessive and inappropriate use leads to a number of consequences in terms of cost, drug interactions, hospital stay and bacterial resistance [7]. In the present study, a total of 150 prescriptions were collected on a random basis. 78 (52%) was found to be prescriptions of male patients while 72 (48%) were of the female patients. The percentage of male prescriptions was found to be higher than that of the female percentile. This data was similar to the study conducted by [8,9].

Among the 150 prescriptions, 50 (33.33%) patients were found to be under the age category of 0-1 year, 60 (40%) patients under the category of 1-7 years, 34 (22.66%) patients under the category of 7-14 years and 6 (4%) patients under the category of 14-21 years. These findings were same to that of study done by [10]. In 150 prescriptions, 155 antibiotics were prescribed in total. The high percentage of antibiotic prescriptions may indicate a high probability of irrational use which may contribute towards resistance as discussed in previous studies [11]. The results were not following the WHO guidelines as high use of antibiotics was observed in conditions where the WHO does not recommend the use of antibiotics. Different routes of administration were also observed. The maximum number of antibiotics were administered through the oral route i.e. 122 (78.70%), 13 (8.38%) of antibiotics administered were injectable, 13 (8.38%) were ophthalmic preparations, 4 (2.58%) were topical in nature whereas 3 (1.93%) of the total antibiotics prescribed were administered through other routes like optic, nasal, etc. This is an indication of over use of injections which result in more adverse drug reactions and should be used for drug therapy as the last resort. The antibiotics prescribed in 150 prescriptions included various types of dosage forms. Highest numbers of antibiotics were prescribed as syrups i.e. 83 followed by tablets i.e. 25. Children are much more comfortable with syrup formulations. It increases compliance and helps in completing the treatment regimen [12]. 145 antibiotics were prescribed under their brand names whereas only 10 antibiotics were prescribed under their generic names, which increase the cost burden of the treatment.

Different classes of antibiotics were prescribed to the pediatric population to treat various diseases. 43 (27.74%) of the antibiotics were cephalosporins, 38 (24.51%) were penicillins, 29 (18.70%) fluoroquinolones, 26 (16.77%) macrolides, 6 (3.87%) glycopeptides, 6 (3.87%) azoles, 5 (3.22%) aminoglycosides, 1 (0.64%) chloramphenicol and 1 (0.64%) phosphonic acid. This data was similar to the findings of [13]. Polypharmacy can unnecessarily increase the cost of treatment and put an additional burden on an already exhausted health care system [14]. Polypharmacy always lead to increased risk of drug interactions, adverse effects, development of antibiotic resistance, increased hospital cost [15].

CONCLUSION

This study gives a detailed description for analyzing the appropriate prescribing pattern of anti-biotics in pediatric outpatients in Hyderabad Metropolitan. Our study concluded that the most common disease for which antibiotics prescribed was bacterial infection. Beta lactam antibiotics mainly Cephalosporins were highly prescribed. Aminoglycoside and Chloramphenicol were least prescribed. This may be considered as an effort to improve the quality of health care. This shows the rationality in prescribing pattern of antibiotics which should be encouraged. Highest numbers of antibiotics were prescribed as syrups. Children are much more comfortable with syrup formulations. It increases compliance and helps in completing the treatment regimen. On the other hand in the present study polypharmacy was seen, which should be avoided and drugs should be prescribed on generic names. Rational use of drugs and knowledge about guidelines for treatment and prevention of common diseases in pediatric population through education is recommended.
Conflicts of interest
The authors declare no conflicts of interest.

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