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Research Article

Pattern of Antibiotics Used in the Pediatrics Indoor Department at Silchar Medical College and Hospital, Assam, India.

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Abstract: Rational antibiotic prescription is very important to prevent antimicrobial resistance. This study was done to identify the commonly used antibiotics in the indoor pediatrics department at Silchar Medical College and Hospital, Assam. It is an effort to encourage more research works in our hospital. It is a prospective study. Total 144 prescriptions of patients treated with antibiotics were collected. Antibiotics were mostly prescribed in the age group of 1yr-6yrs. The major diseases found during this study were Respiratory Tract Infections. The most preferred antibiotics were from the Cephalosporins group. Easier availability of Ceftriaxone in the hospital pharmacy may promote its frequent use. The most preferred route of administration is the intravenous route. Number of antibiotics per prescription is 2.08. Now a day's development of guidelines for proper antibiotics usage in the indoor department is a necessity. It will result in proper utilization of antibiotics.
Keywords: Antibiotics, pediatric, PEM, RTI, prescription, UTI, gastrointestinal

INTRODUCTION

Prescription forms an important link between the physician and the patient. It brings into focus the diagnostic and therapeutic accuracy of the physician. Prescribing standards in a medical setup are to be set and the quality of care the patient is receiving must be accessed through performance review. Medical audits oversee the observance of standards of medical treatment at all levels of the health care delivery system [1]. Antibiotics are among the most commonly prescribed drugs all over the globe. They account for nearly 24% of all new and repeat prescriptions each year.

Children constitute about 40% of India's population [2]. 28% of the world's total population is accounted by Children younger than 15 years of age [3]. With considerable reduction in prevalence of preventable childhood infectious diseases, the dominance is now taken over by respiratory and gastrointestinal infections [4]. Pediatric groups are among the most vulnerable population groups to contact illnesses and cause harmful effects of drugs due to differences in pharmacodynamic and pharmacokinetics [5].

Antibiotics are playing a great mentor in treating infectious diseases. However, there are also reports of an irrational use of antibiotics leading to infections that are worse than the originally diagnosed ones. The association of resistance with the use of antibiotics has been documented in both indoor patient and outpatient setting [2]. Widespread irrational usage of antimicrobial agents and their shortage of supply in the government hospitals, low purchasing capacity of patients and incidence of antimicrobial resistance complicate the outcome of the therapies.

In a setup like ours where majority of the population belongs to the low socio economic strata, it is a must for a physician to prescribe drugs available at the hospital pharmacy. The data generated here will be helpful in planning studies on prescribing pattern and drug utilization patterns. This prospective study was done to observe the pattern of antibiotics used in the Pediatrics indoor department at Silchar Medical College and Hospital, Assam.

MATERIALS AND METHODS

This prospective study was carried out by collecting prescriptions of the indoor patients admitted in the wards of pediatric department at Silchar Medical College and Hospital, Assam. Before initiating the study, proper approval was taken from the Institutional Ethics Committee (ISC) and the Chief Superintendent of Silchar Medical College and Hospital. Total 144

prescriptions of patients treated with antibiotics from 24 July 2014 to 24 October 2014, a period of 3 months, were collected for the study. Prescriptions with antibiotics were collected irrespective of the indications. The data were collected in a data sheet, containing information regarding age and sex of the patients as well as name of antibiotics, numbers of drugs prescribed, frequency, route of administration, along with the clinical diagnosis. The data obtained & the patient related parameters were computed using Ms-Excel 2007. The results were expressed as percentage/proportion either as pictorial representation in the form of bar diagram a pie chart or in the tabular form.

To Observe The Pattern Of Antibiotics Used In The Pediatrics Indoor Department At Silchar Medical College And Hospital, Assam						
Regn no.	Sex	Age	Antibiotics used	Dose	Route	Diagnosis

RESULTS AND DISCUSSION

Distribution of the patients

Most of the cases where antibiotics were prescribed were in the age group of 1yr-6yrs. It was then followed by the age group 6 wks- 1yr and minimum number of patients were seen from the age group of 6 yrs- 12yrs.

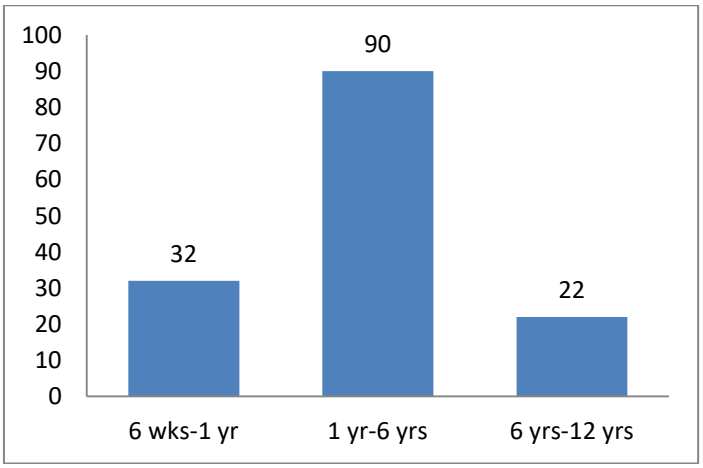

Fig-1: Distribution of the patients with age

Preference of antibiotics

The most preferred antibiotics by the physicians, during the study period, were Cephalosporins. Among the total number of Cephalosporins prescribed, the highest were prescribed for Respiratory tract infections (Fig 2). Among the cephalosporin group, Ceftriaxone was most commonly prescribed. It was followed by Cefotaxime. The 2nd antibiotic group that was commonly prescribed is from the Aminoglycosides. Amikacin was frequently prescribed from this group, followed by Tobramycin. Amikacin was seen equally preferred both for the respiratory and the gastro-intestinal system disorders. It was followed by Carbapenems and Meropenem. It was seen frequently used for pyrexia of unknown origin (PUO). Among the Penicillins group, Amoxicillin in combination with Clavulanic acid was frequently used. From the Fluroquinolone group, Moxifloxacin was used. Metronidazole was used frequently used for gastro-intestinal tract disorders. From the glycopeptides group, Vancomycin was used frequently for respiratory tract disorders and also in some disorders from the central nervous system.

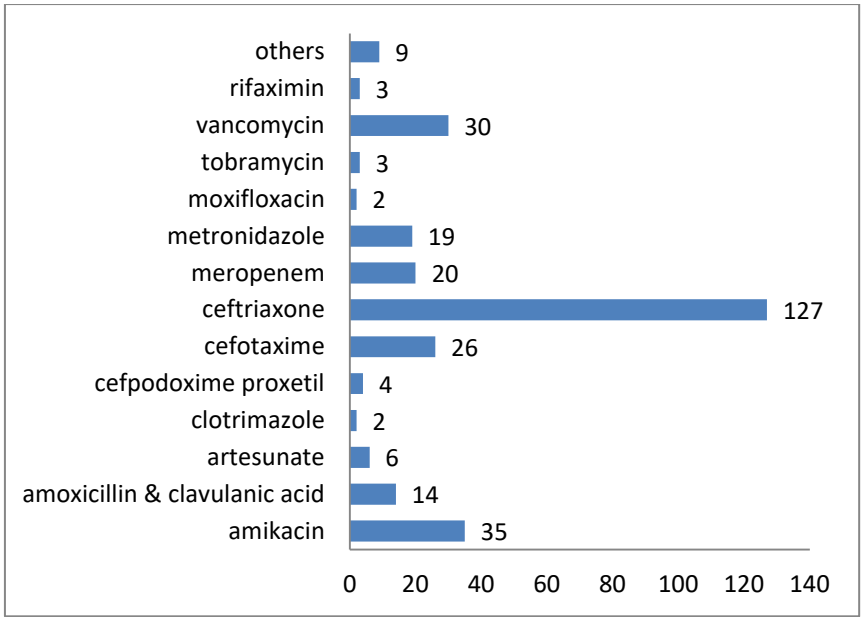

Fig-2: Preference of antibiotics

Frequency of prescribing patterns of antibiotics in accordance with diagnosis:

Highest numbers of antibiotics were prescribed for respiratory tract infections (86) followed by gastro-intestinal disorders (50) and miscellaneous conditions (47). Among the total number of antibiotics prescribed for respiratory tract infections (RTI), the highest numbers were prescribed from Cephalosporin group followed by the Glycopeptide. Similarly among the total numbers of antibiotics prescribed for miscellaneous conditions, highest numbers were from Aminoglycosides followed by glycopeptides and the Aminoglycoside group. For treating pyrexia of unknown origin (PUO), Carbapenem was mostly prescribed (Meropenem) followed by the Cephalosporins. In the disorders of the cardiovascular system, renal system, respiratory system, hepatobiliary system, also in septic shock and protein energy malnutrition (PEM) Ceftriaxone was mostly prescribed, while in the disorders of the gastrointestinal tract, Metronidazole was frequently seen. Cefotaxime was mostly given in the children and infants suffering from jaundice (Table-1).

Table-1: Frequency of prescribing patterns of antibiotics in accordance with diagnosis

Diagn-osis	Ceftri-axone	Cefot-axime	Amik-acin	Amoxi-cillin	Merope-nem	Vanco-mycin	Metroni-dazole	Moxif-loxacin	Others
RS	36	7	10	8	0	16	1	0	8
CNS	5	0	0	1	0	5	0	0	0
Git	14	3	10	0	0	2	14	1	6
PUO	13	1	2	1	14	3	0	0	5
Jaundice	1	3	1	0	0	0	0	0	
Renal system	16	3	1	2	0	0	0	0	2
hepatic	2	1	1	0	0	0	0	0	0
UTI	2	0	3	0	0	0	0	1	1
CVS	3	0	0	0	0	0	0	0	0
Septic shock	3	0	3	0	0	0	0	0	0
PEM	8	0	0	0	5	0	2	0	4
others	24	8	5	2	1	4	2	0	1
total	127	26	35	14	20	30	19	2	27

RS= respiratory system, CNS= central nervous system, GIT= gastrointestinal system, PUO= pyrexia of unknown origin, UTI= urinary tract infection, CVS= cardiovascular system, PEM= protein energy malnutrition.

d) Route preferred for the antibiotics

The most preferred route for the antibiotics in the indoor department is the intravenous (81.33%, 244). Oral route use is 18.67% (56). Other route preferred is 0.67%.(Fig-3).

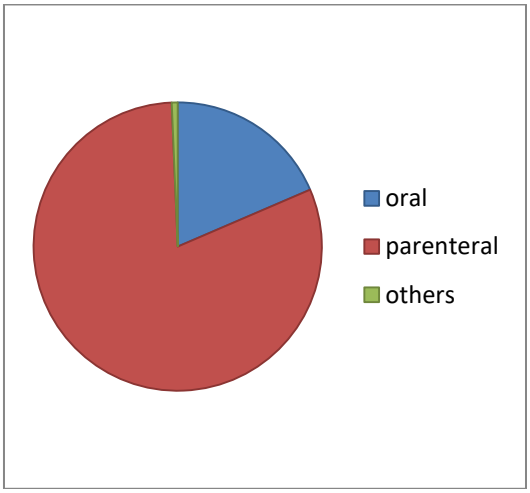

Fig-3: Route preferred for the antibiotics

Number of antibiotics per prescription

Among 144 prescriptions studied, it was found that 95 (65.98%) prescriptions constitute single antibiotics use while 49 (34.02%) prescriptions contain either two or more than two antibiotics use. Number of antibiotics per prescription is 2.08.

Table-2: Number of antibiotics per prescription

prescriptions with 1 or >1 antibiotics use	Total no.
>1 antibiotics	49 (34.02%)
1	95 (65.98%)
Total	144

DISCUSSION

A study by Dr. Shivaleela showed that most number of pediatrics patients belonged to age group of 1-5years (47%) and next in 5-13years (43%) [6]. Our study also showed most patients to be associated with the age group of 1yr-6yrs. This indicates that more chances of infections in 1-6 years age group.

The major diseases found in the study done by Nakul Gupta et al. were Respiratory Tract Infections (35.62%) [7]. Our study at the hospital also showed maximum cases to be involving the respiratory tract. This shows uniformity in the diseases of the children irrespective of the different regions.

The Study by Choudhury DK and Bezbaruah BK showed maximum no. of antibiotics prescribed were Amoxycillin+Clavulanic acid (35%) [5]. The research work by Khaled M Alakhali, Asif Ansari Shaik Mohammad showed Cephalosporin (52%) group of antibiotics to be the most frequently prescribed antibiotics followed by Aminoglycoside group [8]. Our study showed maximum antibiotics were prescribed from the Cephalosporin group. Among the Cephalosporin group, Ceftriaxone was most commonly prescribed. Aminoglycosides followed up in the study. Studies in this category of most commonly prescribed antibiotics varied greatly as the availability of antibiotics takes a foremost importance as most of the medical setup supply of medicines is commonly based on the government supply of drugs. For ex. In the sudy by Vipul Prajapati and J.D. Bhatt highest numbers of antibiotics prescribed were from Aminoglycosides (233; 33.77%) while Macrolides were the least (06; 0.87%) prescribed[1].

The route preferred in our study is intravenous as it deals with the indoor patients. Even in the study by Prajapati et al at the pediatric wards, it was found out that 86.81% antimicrobial agents were prescribed for parenteral administration, while only 13.18% were for oral route [1]. Inappropriate prescription not only increases the cost of medical treatment but also increases the morbidity and mortality [9]. Extreme and empirical treatment is an important cause of irrational antibiotics use.

Average antibiotics use in our hospital showed to be of 2.08. The work by D. Sharma, KH. Reeta highlighted single antibiotic use was only 16.22% in Pediatrics [10]. It pointed out that two drug treatments was more common in Pediatrics (59.9%).

The work by R. Bharathiraja et al mentioned presence of fever was considered a significant factor for prescribing antibiotics [11]. In children with diarrhea and fever, Fluoroquinolones were commonly prescribed showing the misuse of antibiotics in that study. More research works are needed in our hospital so that these factors also are taken into account, which maybe an important factor in drug resistance.

CONCLUSION

Prescriptions reflect the physician's attitude towards a patient. In our setup it was observed that most of the antibiotics prescribed were from the pharmacy store at the hospital. This study also highlights the importance of broad spectrum antibiotics in the indoor pediatrics department. Most of the cases were from the age group of 1 yr- 6 yrs. Less number of cases were seen in the age group of 6 yrs-12 yrs. In cases of severe ailments, the number of antibiotics per prescription even exceeded more than 2. So the average number of antibiotics per prescription was 2.08.

Ceftriaxone was found to be the most common antibiotic prescribed. It was observed to be used in combination with Amikacin to cover broad spectrum of microbes. Physician's choice and easier availability of Ceftriaxone in the hospital pharmacy may promote heavy use of this particular drug. Other factor contributing to the preferential uses of the above antibiotics in the wards may be due to their low cost with better safety profile.

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