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## A Study on Usage of Antibiotic's In Pediatric Department of Teaching Hospital

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### ABSTRACT

Antibiotics are among the most commonly prescribed drugs in pediatrics. Because of an overall rise in healthcare costs, 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. Before such policies can be implemented, detailed knowledge of antibiotic prescribing practice is important. The objective of this study is to assess the prescribing pattern of antibiotic in pediatric in-patient department, which is a prospective study, undertaken over 190 patient's prescription of pediatric in-patient department, of two month's duration from February to March 2012. Altogether 190 patients, 114 males (60%) and 76 females (40%), were enrolled. Highest rate of Antibiotics prescription was observed for children aged between 1-5 years. Most of the prescriptions contain two drug therapies. Penicillin derivatives were choice of Antibiotics for pediatric patients. Pneumonia was the most prevalent diagnosis among children. Use of Antibiotics for Viral infections should be reduced. Standard treatment guidelines for the treatment of common diseases should be formulated.

**Keywords:** Antibiotics, Pediatrics, Prescription, Prospective Study

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## INTRODUCTION

Antibiotics are among the most widely prescribed therapeutic agents among pediatric patients [1]. Infants and children represent a large part of the population in developing countries [2]. Pediatric population is prone to suffer from recurrent infections of the respiratory tract and gastrointestinal system. Lower respiratory tract infections are the leading cause of death in children below 5 five years of age [3]. Acute respiratory infection, acute watery diarrhea and viral fever are the common childhood illnesses accounting for the major proportion of pediatric visits [4]. The use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of pediatric illnesses [5,6]. Several studies focusing on antibiotic prescribing attitudes in hospitalized children indicate that approximately 35% of infants and children admitted to hospitals receive antibiotics and widespread misuse has been reported [4] Higher incidence of infections in infants and children as compared to adults leads to higher use of antimicrobials and contribute to an overall increase in healthcare costs as well as potentially severe adverse drug reactions [7-9]. Several professional societies have issued guidelines designed to reduce the use of antibiotics world- wide by means of various control strategies [10,11] Detailed knowledge of antibiotic prescription pattern is important before the policies and measures can be implemented.

## MATERIAL AND METHODS

The present study was conducted in inpatient department of Acharya Vinoba Bhave Rural Hospital, which is a tertiary care hospital between the period of February and March 2012, to determine the antimicrobial drugs prescribing pattern in pediatrics patients. The Study include determination of various pediatric diseases, Literature survey, Preparation of data entry format and Collection of cases, Data analysis and Identification of pattern of antibiotic use. A total of 190 cases were studied in inpatient ward, which have complete information as per inclusion criteria. Permission for collection of data and to accompany physician in the pediatric ward was taken from Head of pediatric department before starting the study. The relevant data were collected in specially designed Performa, which contained patient demographics (age, sex and outcome of the patients), diagnosis, drug details and duration of therapy.

## STATISTICAL ANALYSIS:

The data was subjected to descriptive analysis using Microsoft Excel. Chi square test was used to assess the correlation between diseases encountered and age group.

## RESULT

The demographic profile in this study showed male (61.05%) to female (38.95%) proportion in this study indicating that males patients was comparatively more than the number of female patients approaching for consultation. More number of cases were in age group 1-5years (37.36%). Significant use of antimicrobials was observed for conditions like

pneumonia (21.05%), bronchitis (15.26%) and acute gastro enteritis (14.74%). These conditions were most common reason for the hospitalization of the pediatric patients. Among all patient prescribed with antibiotics, pneumonia was the most common diagnosis. Pneumonia and AGE were mostly prevalent in infants and children of age up to five years. But bronchitis was mostly found in children of age group 5-12 and infants. Other common illnesses for hospitalization were enteric fever, viral fever, UTI, meningitis, whooping cough, measles, and sepsis.

**Table 1: Pediatric in-patient characteristics**

Parameters	%	No.
<b>Age</b>		
1 month - 1 year	28.42	54
1-5 years	37.36	71
5-12 years	34.21	65
<b>Sex</b>		
Male	61.05	116
Female	38.95	74

**Table 2: Indications For Which Antibiotics Were Prescribed**

S.N	Indications	No. of Patients	Percentage (%)
01.	Pneumonia	40	21.05
02.	Bronchitis	29	15.26
03.	AGE	28	14.74
04.	Viral Fever	23	12.10
05.	Enteric Fever	16	8.43
06.	Whooping Cough	10	5.26
07.	UTI	09	4.74
08.	Meningitis	09	4.74
09.	Urticaria	06	3.15
10.	Measles	04	2.10
11.	Others (Sepsis, hernia etc. )	16	8.43

AGE - Acute Gastro-entritis; UTI - Urinary tract Infection

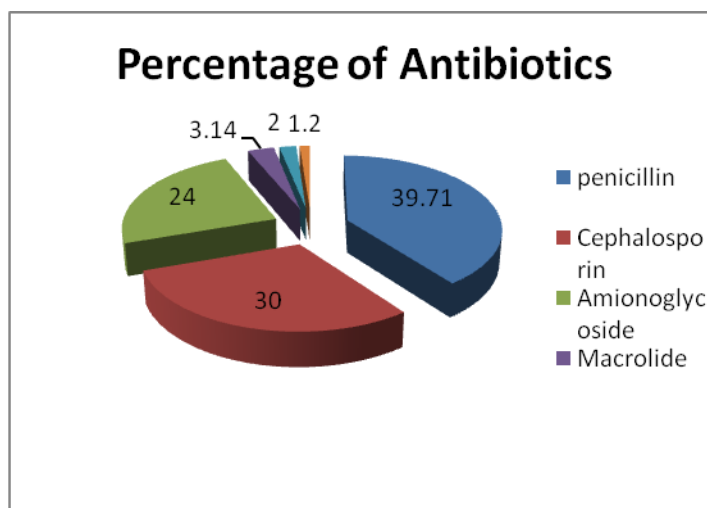
A high percentage of patients i.e 104 (54.78%) were prescribed at least Two antibiotic, One antibiotic was prescribed to 63 (28.57%), three antibiotics were prescribed in 20 (10.52%) and four antibiotics were prescribed in only 3 (1.15%) cases. Similar study conducted assessed that two antibiotics were prescribed in more cases (37%), which was similar to this study [12]. Another study assessed that, of the 687 patients hospitalized, 203 patients were prescribed with antimicrobials and 98% of patients were prescribed a single antimicrobial which was different from this study [13]. So due to differ in morbidity pattern and economically we cannot make a firm conclusion.

Most of the cases of Pneumonia, Bronchitis, Urinary tract infection (UTI) and Meningitis were treated with at least Two antibiotics. Enteric fever (E. fever) was the diagnosis where many cases were treated by single antibiotic.

Penicillin derivatives (39.71), Cephalosporin (22.78%) and Aminoglycoside (24%) were choice of Antibiotics for pediatric patients, which comprised of Amoxicillin/clavulanate (20.85%), Ampicillin/cloxacillin(16.86%) , Piperacillin/ tazobactum (1.43%) and Benzyl penicillin (0.57%) Cefotaxim (11.14%) , Cefixime (8.86%) Ceftriaxone (7.72%), Cefaclor (1.71)and Cefpodoxime (0.57), Amikacin respectively. Among Cephalosporins third generation Cephalosporins like Cefotaxim , cefixime sand Ceftriaxone were Antibiotics of choice for pediatric patients, Among Aminoglycosides Amikacin was the only drug which was prescribed for the pediatric patients in this study. In this study Amoxicillin/clavulanate and Ampicillin/ Cloxacillin were mostly prescribed drugs among penicillin derivatives.

**Table 3: Usage Pattern of Antibiotics**

S.N.	Antibiotic	No. of Prescriptions	Percentage of Prescriptions
01.	Penicillin derivative	139	39.71
	Amoxicillin+clavulenic acid	73	20.85
	Ampicillin, Cloxacillin	59	16.86
	Piperacillin+Tazobactam	5	1.43
	Benzyl Penicillin	2	0.57
02.	Cephalosporin	105	30
	Cefotaxim	39	11.14
	Cefixime	31	8.86
	Ceftriaxone	27	7.72
	Cefaclor	6	1.71
	Cefpodoxime	2	0.57
03.	Aminoglycoside (Amikacin)	84	24
04.	Macrolides (Azithromycin)	11	3.14
05.	Fluoroquinolones (Ofloxacin)	07	2
06.	Other	05	1.2



Penicillin derivatives were the top most frequently prescribed antibiotic followed by Cephalosporin and then Aminoglycoside. Among Aminoglycosides only Amikacin was prescribed and Among Macrolides only Azithromycin was prescribed.

## DISCUSSION

The number of male patients was comparatively more than the number of female patients. Pneumonia was the most prevalent diagnosis among infant, which agrees with previous studies.

A high percentage of patients 54.78% were prescribed at least two antibiotics which is similar to study which assessed that two antibiotics were prescribed in more cases (37%) [12], while differ from study assessed that 98% of patients were prescribed a single antimicrobial agent [2]. It is not possible to draw any firm conclusion since the patients are not matched socio- economically. The morbidity pattern also may not be similar.

Ampicillin/Cloxacillin and Amikacin were found to be mostly used combination antibiotics in case of pneumonia. Enteric fever was generally treated by ceftriaxone. It is the only disease where exposure to combination antibiotic was found to be minimum.

Pneumonia was the most prevalent diagnosis among infant, which agrees with studies. Highest rate of AMAs prescription was observed for children aged between 1-5 years was different kind with that of the study , which shows infant less than 2 years received antibiotics more frequently than older children [13].

Penicillin derivatives were the top most used class of antibiotics in this study followed by Cephalosporin. Among cephalosporins, third generation of ceftriaxone and cefotaxim were found to be mostly used. The use of fluoroquinolones by 2 percent of total antibiotics reminds that no quinolones were used by pediatric services because of their toxic effects in children below 14 years of age. Ciprofloxacin, as one of the frequently prescribed quinolone, deserves continued monitoring.

## CONCLUSION

In conclusion, the main challenges in prescription of antibiotics are to achieve a rational choice and appropriate use of antibiotics and to recognize their potential problems. Consequently, physicians must keep a clear understanding need for microbiological diagnosis, use of antibiotics and make good judgment in clinical situations. Empirical therapy and antimicrobial usage for viral infection can be reduced by the availability of rapid diagnostic method to differentiate between viral and bacterial infection. Proper education program on rational usage of drug and an antimicrobial order form should be implemented in the hospitals to reduce the inappropriate therapy. Standard treatment guidelines for the treatment of

common diseases should be formulated. For achieving the goal of rational use of medicines it is not sufficient to choose the right medicines only but also they must be employed in the most appropriate manner. There is an ample scope of improving the prescribing pattern by keeping the number of medicines as low as possible, using medicines appropriately after selecting and consciously keeping the cost of therapy low.

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