

## PRESCRIBING PATTERNS OF ANTIBIOTICS IN PAEDIATRICS FOR RESPIRATORY TRACT INFECTIONS/DISORDERS IN TERTIARY CARE HOSPITAL

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### ABSTRACT

**Objectives:** The main objective was to study the prescribing practice of antibiotic in hospital in-patient is to assess the prescribing patterns of antibiotics in children who were admitted in a tertiary care hospital regarding respiratory tract infections and to check out which category of antibiotics are most prescribed.

**Methods:** The study which includes a retrospective monitoring of pediatrics undergoing treatment with diff types of antibiotics were carried out for a period of 6 months both in-patient as well as outpatient.

**Results and Discussion:** A total of 50 patients were screened. The most common category of antibiotic prescribed is aminoglycosides (48%), broad-spectrum antibiotics (29%), cephalosporins (14%), and fluoroquinolones (7%) macrolides (2%). 48% were admitted with common cough and cold accompanied by fever, 24% with bronchopneumonia, 14% with bronchial asthma, 12% with bronchitis, 2% with pneumonia. The number of antibiotics per prescription ampicillin with garamycin were 51%, cefuroxime with garamycin were 21%, ciprofloxacin with garamycin were 10%, cefotaxime with garamycin was 7%, ciprofloxacin with amoxicillin was 2%, single antibiotic prescribed are cefuroxime (2%), garamycin (4%), ciprofloxacin (4%). Adverse drug events were detected in sample size n=50 were 6% for drugs with ampicillin (rashes \*4 days), ciprofloxacin (loose stools \*2 days).

**Conclusion:** In order to reduce the risk of antibiotic resistance of microbes, an antibiotic policy should be carefully instituted and implemented. The doses prescribed to the pediatrics should be calculated according to the weights in order to avoid adverse drug reactions.

**Keywords:** Antibiotics, paediatrics, infections

### INTRODUCTION

Pediatrics is the branch of medicines dealing with the development, diseases, and disorders of children [1]. Infancy and childhood is a period of rapid growth and development. Compared to adult medicine, drug use in pediatrics is not extensively researched and the range of licensed drugs inappropriate dosage form is limited. Drug therapy is considered to be a major component of pediatric management in healthcare setting like hospital. The use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of pediatric illnesses [2,3]. The key role of antibiotics for the treatment of infectious diseases that are prevalent everywhere in developing countries may not be denied. However, there are also reports of an irrational use of antibiotics [4,5] which may even lead to infections that are worse than the originally diagnosed ones.

Antibiotics may be informally defined as the subgroup of anti-infectives that are derived from bacterial sources and are used to treat bacterial infections. Other classes of drugs, most notably the sulfonamides, may be effective antibacterials. Similarly, some antibiotics may have secondary uses, such as the use of demeclocycline (declomycin, a tetracycline derivative) to treat the syndrome of inappropriate antidiuretic hormone secretion. Other antibiotics may be useful in treating protozoal infections.

Various drug prescription problems have been identified in health facilities in developing countries. This includes the irrational use of drugs, unnecessary polypharmacy and high use of drugs with unproven efficacy. Some of these studies have shown that antibiotics are one of the most commonly prescribed drugs among

physicians and have identified its overuse [6] Antibiotic resistance can be tackled by effective auditing of production of the drugs manufacturers, sales by wholesalers and retailers, and prescription by health care professionals. Standard of treatment of ailments have been found to be improved at all levels of the health care system if a medical audit is done. The National Drug Policy has also made recommendations for ensuring proper drug use [7]. Essential drug lists and standard treatment guidelines also serves as a guide in diagnosing, management, and treatment of medical conditions among health workers in order to promote the rational use of drugs by prescribers, dispensers and consumers as stated in the National drug policy.

#### Asthma

Asthma can be defined as a chronic inflammatory disorder of the airways, characterized by recurrent episodes of wheezing, breathlessness, chest tightness, and cough that is often reversible, either spontaneously or with treatment. Different terms such as allergic or asthmatic bronchitis, wheezy bronchitis, intrinsic, and extrinsic asthma are frequently employed in clinical practice.

#### Pneumonia

Pneumonia is a lung infection involving the lung alveoli (air sacs) and can be caused by microbes, including bacteria, viruses, or fungi.

Pneumonia an infection of the small air sacs of the lungs (alveoli) and the tissues around them and is one of the most common causes of death worldwide. Often, pneumonia is the final illness in people who have other serious, chronic diseases [8].

**Bronchitis**

Bronchitis is swelling and irritation in the air passages, that is, the tubes that connect the windpipe to the lungs. It causes swelling and irritation of the airways. With acute bronchitis, you usually have a cough that produces phlegm and pain behind the breastbone when you breathe deeply or cough [9].

**METHODS**

Inclusion criteria:

- In-patients of age fall between 1 month and 12 years.
- Patients who are diagnosed with underlying diseases.
- Patient characteristics such as age, sex, body weights, past medical, and medication history.
- Patients with lower respiratory tract infections and fever with cough and cold.
- Patients who are hospitalized (in-patients) in the pediatrics department.

Exclusion criteria:

- Patients aged above 12 years.
- Patients with comorbid conditions.

Total sample size was 50 prescribed antibiotics per patient were noted. Similarly, admission and discharge diagnosis, and the condition of the patients on admission and discharge were recorded. Moreover, drug data, including name of the drug, dosage regimen (form, route, frequency and duration), and the date on which the pharmacotherapy was instituted, were recorded. Blood transfusion and nutritional preparations were not included in the study. The prescribing indicators according to WHO measure the performance of health care providers [7]. The indicators are based on the practices observed in a sample of clinical encounters taking place at outpatient health facilities for the treatment of acute or chronic illness. These encounters can be observed retrospectively, from data recorded in historical medical records, or they can be observed prospectively, from a group of patients attending the clinic on the day the data are collected.

**RESULTS**

Drug data and patient characteristic data were computed using Ms Excel (Tables 1 and 2).

The total number of study population was 50 of which 62% were male and 38% were female.

**Table 1: Gender distribution**

Gender	Total (%)
Males	62
Females	38

**Table 2: Age distribution of diseases**

Age group	Overall (%)	Bronchial asthma (%)	Pneumonia (%)	Bronchitis (%)	Bronchopneumonia (%)	Fever with cough and cold (%)
Infants<1 year	16	0	0	2	6	8
Young kid 1-6 years	58	6	2	10	10	30
Old kid 7-12 years	26	8	0	0	8	10

**Table 3: Frequency of individual antibiotic for specific diagnosis**

Diagnosis	Ampi	Gara	Amox	Cipro	Cefita	Cefuro	Erythro
Bronchial asthma	6	6	1	2	0	0	0
Pneumonia	0	0	0	0	0	0	0
Bronchitis	4	6	0	1	0	2	0
Bronchopneumonia	9	12	0	2	0	2	0
Fever with cough and cold	7	21	0	2	2	9	2

Among the study population, the age was ranging from 0 to 12 years. The age was differentiated into 3 groups such as infants from 1 month to 1 year, followed by young kids ranging from 1 to 6 years, followed by old kids from 7 to 12 years. The numbers of young kids were 58% age 1-6 years, followed by old kids 26% age between 7 and 12, and 16% were below 1 year named infants. This data shows that the age group between 1 and 6 years were more affected by respiratory tract infections (Table 3).

Frequency percentage of antibiotics prescribed for specific diagnosis was assessed. It shows that garamycin (aminoglycosides) is the most prescribed antibiotic (45), except for pneumonia. Second, comes the ampicillin (broad spectrum antibiotic) (26). Followed by, cefuroxime (cephalosporin) (13), except for bronchial asthma, and pneumonia. Ciprofloxacin (7) later ceftriaxone and erythromycin last but not the least usage of drug is amoxicillin (Table 4).

Among dosage forms, 47% were oral, 23% were parenteral, 13% cough syrups, 8% vitamins, 5% nebulizers, and 4% bronchodilators (Tables 5-10).

**DISCUSSION**

The number of male patients was comparatively more than the number of female patients. Of them, 16% were infants, 58% were young kids (1-6 years), 26% were old kids (7-12 years). Of the entire study sample, total number of antibiotics are 96 (26%) were encountered in a survey and (96%) of them were given two or more antibiotics remaining (10%) were single therapy antibiotics. The most common category of antibiotic prescribed is aminoglycosides (48%), broad-spectrum antibiotics (29%), cephalosporins (14%), fluoroquinolones (7%), and macrolides (2%). Diagnosis patterns in different age group was analyzed it was found that 48% were admitted with common cough and cold accompanied by fever, 24% with bronchopneumonia, 14% with bronchial asthma, 12% with bronchitis, 2% with pneumonia. According to WHO prescribing indicators, average drugs per prescription were found to be 7.2% of encounters of antibiotics and injections prescribed (25.2%), percentage of drugs prescribed from essential drug list (94.8%). Total Antibiotics prescribed for males 54% for females 38%. The number of antibiotics per prescription Ampicillin with garamycin was 51%, cefuroxime with garamycin were 21%, ciprofloxacin with garamycin were 10%, cefotaxime with garamycin was 7%, ciprofloxacin with amoxicillin was 2%, single antibiotic prescribed are cefuroxime (2%), garamycin (4%), ciprofloxacin (4%). Adverse drug events were detected in sample size n=50 were 6% for drugs with ampicillin (rashes \*4 days), ciprofloxacin (loose stools \*2 days).

**CONCLUSION**

In order to reduce the risk of antibiotic resistance of microbes, an antibiotic policy should be carefully instituted and implemented. The

Table 4: Diagnosis patterns % in different age groups

Diagnosis	<1 year (%)	1-6 years (%)	7-12 years (%)	Total (%)
Bronchial asthma	0	6	8	14
Pneumonia	0	2	0	2
Bronchitis	2	10	0	12
Bronchopneumonia	6	10	8	24
Fever with cold and cough	8	30	10	48

Table 5: Drug use situation in health facilities

Dosage forms	Percentage
Parenteral	70 (23)
Oral	143 (47)
Vitamines	24 (8)
Cough syrup	38 (13)
Bronchodilators	12 (4)
Nebulizers	15 (5)

Table 6: Children health-related history according to their parents

Antibiotic usage/year	Never	Once	2-3 times	4-5 times
Bronchial asthma	0	3	4	4
Bronchitis	0	1	5	0
Pneumonia	0	1	0	0
Bronchopneumonia	0	3	9	4
Fever with cough and cold	4	5	15	5

Table 7: Number of antibiotics/prescription

Name of antibiotic	Number/prescription
Ampicillin+garamycin	26
Cefuroxime+garamycin	11
Ciprofloxacin+garamycin	5
Cefotaxime+garamycin	3
Ciprofloxacin+amoxicillin	1
Cefuroxime	1
Garamycin	2
Ciprofloxacin	2

doses prescribed to the pediatrics should be calculated according to the weights in order to avoid adverse drug reactions.

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Table 8: Antibiotics prescribed for male and female

	Male (%)	Female (%)
Ampicillin+garamycin	40	12
Cefuroxime+garamycin	6	16
Ciprofloxacin+garamycin	8	2
Cefotaxime+garamycin	0	6
Ciprofloxacin+amoxicillin	0	2

Table 9: Appropriateness of antibiotics prescribed in Tertiary Care Hospital

Name	Dose			Strength	Frequency	
	Over	Under	Optimum	Correct	Correct	Incorrect
Ampicillin	0	5	21	21	21	0
Gentamycin	5	8	30	30	30	0
Ciprofloxacin	0	1	6	6	6	0
Cefuroxime	0	0	6	6	6	0
Amoxicillin	0	0	1	1	1	0
Cefotaxime	0	0	2	2	2	0
Erythromycin	0	0	2	2	2	0

Table 10: Reasons for admission

Reasons for admission	Patient (%)
Fever	82 (41)
High grade	42 (21)
Low grade	4 (2)
Chills	16 (8)
Emesis	30 (15)
Cough	88 (44)
Cold	100 (50)
Abdominal pain	24 (12)
Throat pain	10 (8)
Dyspnoea	4 (2)
Breathing difficulty	18 (9)
Rigors	2 (1)
Crepts	24 (12)
Wheeze	22 (11)
Tachypnea	14 (7)

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