WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 12, Issue 6, 715-738. Research Article ISSN 2277– 7105

A PROSPECTIVE OBSERVATIONAL STUDY ON PRESCRIBING PATTERN OF ANTIBIOTIC IN PAEDIATRICS

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Article Received on
27 Feb. 2023,

Revised on 18 March 2023,
Accepted on 08 April 2023

DOI: 10.20959/wjpr20236-27777

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ABSTRACT

Antibiotics are the most regularly prescribed medication in the Paediatric department and are crucial for the treatment of infections. Due to their increased susceptibility to serious bacterial infection children are at higher risk of infection and are frequently administered with antibiotics. The main objective of our study is to assess the prescribing pattern of antibiotics in paediatrics with infections. A prospective observational study which was carried for a period of 6 months amongin-patients in the Paediatric department of a tertiary care hospital. Patients of both the sex, under the age of 12 years and atleast taking one antibiotic were included. Demographic details, drugs prescribed, Laboratory investigations were reported. A total of 120 patients were included in the study, out of which 79 were male and 41 were female. 57 % of the patients belonged to the age group of 1 Month – 2 Years. Most of them were diagnosed with Respiratory tract infections. 73% of the prescribed antibiotics were Amoxicillin from the class of Penicillin. 78% of paediatric patients received the combination of Amoxicillin+ Clavulanic acid. For the proper management and effective treatment of the paediatric patient, a culture sensitivity test must be performed. Thus regular studies are needed to determine prescribing pattern of medications in order to enhance the adherence, prevent the risk ofresistance, reduce repeated hospital admissions and improve the quality of life.

KEYWORDS: Antibiotics, Culture sensitivity, Resistance, Prescribing pattern.

INTRODUCTION

India, a developing nation in South Asia with a relatively low income, has a significant risk of mishandling and consuming antibiotics and has a low level of public awareness of growing threat by antimicrobial resistance.[1] Antibiotics are the most regularly prescribed medication in paediatric department and are crucial for the treatment of infection. The main use of antibiotics is to treat bacterial infections. Antibiotics possess two main properties i.e Bacteriostatic compounds which prevent the growth of bacteria whereas bactericidal compounds are employed to kill them. Due their increased susceptibility to serious bacterial infection, children are at high risk of infection and are frequently administered with antibiotics.[2,3] The meaning of antibiotic resistance is the ability of microorganisms to withstand antimicrobial agents. In order to prevent antimicrobial resistance, antibiotics should be used cautiously in paediatric.[4] Childhood is the time of rapid growth and development. Immune system will not be fully matured in paediatric so they are most vulnerable population to acquire an illness.

The primary goal of our research is to establish the trend or pattern of antibiotic prescribing in hospitalized paediatric patients. The rational use of antibiotics is necessary to exaggerate benefits and reduce the resistance and treatment failure. While selecting an antibiotic, suitable dose, formulation, pharmacokinetic profile, response and adverse drug reactions (ADR) should be considered otherwise it might result in serious consequences and increase the spread of antibiotic resistance.[5] The adherence of medical treatment standards is monitored by prescription pattern analysis at all stages of the health care system. Prescription pattern are studied to monitor, analyze and advice changes to doctor's prescription behaviour in order to make paediatric care more effective and reasonable.[6] Strict antibiotics policies should be recommended amid growing concerns over inconsistent prescription prescribing practice and the development of antibiotics resistance.

The main drivers of antimicrobial resistance include use and misuse of antimicrobials. This has developed a fear in experts, concerned about the antibiotic shortages in the future. As a result, a proactive approach to an appropriate use, particularly in paediatric population should be followed.[7]

In paediatric illness use of antimicrobial agents especially antibiotics has become standard therapy. Due to a lack of antibiotic medication, paediatric doctors face a number of

difficulties while prescribing them. Proper guidelines must be implemented inorder to administer antibiotic to children.[8]

The ability of prescribing drugs is one that needs to be constantly improved. Anti-microbial therapy requires a preliminary clinical assessment of the nature and severity of the infectious process as well as information of the most likely causative organism. When it is appropriate, laboratory research and susceptibility testing shouldbe used to support this assessment of the infection.[9]

This study provide an overview of the antibiotics usage pattern in paediatrics and thus highlight the importance of rational use by identifying the disease pattern and antibiotics sensitivity. As a result it will aid in the improvement of paediatric care.[10]

Antibiotics typically prevent the growth of bacteria, but when bacteria becomes less susceptible or they become resistant, a larger concentration of the same medication is required to have an impact. The development of diseases that are resistant to antimicrobials is a natural outcome of the widespread use of antibiotics, and inappropriate use of the same which increasing the emergence and expansion of antibiotics resistant organism in the population which raises the demand for new medications.[11]

Antibiotics begin to fight an infection in less than no time, but it is also crucial to finish the entire course of antibiotics to stop the infection from coming back. If the drug is stopped before the course is complete, there is a greater chance that the bacteria will develop resistance to subsequent treatments.

Every hospital should make it necessary to undergo culture sensitivity test so as to avoid the ineffective use of antibiotics before prescribing any drug for an infection. This process requires examination of the right specimen and culture for selection of appropriate antibiotics. When it is appropriate and necessary to establish the precise microbiological diagnosis before beginning antibiotic therapy, the paediatrician should enquire as to whether the proper sample has been acquired for culture or other microbiological studies.[12]

In order to rationalize the antibiotics usage it must have few practices that will help to do the same. WHO Indicator is one among which will help to determine number of drugs used followed by Antibiotics prescribed by generic names and under the hospital formulary.

Prescribing by generic names is one of the important factor that will help the health care professional to avoid confusion while prescribing dispensing or administering the drug and also this helps in better inventory control.

Choice of anti-microbial in paediatrics

The most commonly prescribed antibiotics for paediatrics in our study according to the latest national guidelines was found to be

Amikacin

Class: Aminoglycoside

Mechanism of action: Susceptible gram-negative organisms allow aminoglycosides to diffuse through porin channels in their outer membranes. These organisms also have an oxygen-dependent system that transports the drug across the cytoplasmic membrane. The antibiotic then binds to the 30S ribosomal subunit prior to ribosome formation. Then it interferes with assembly of the functional ribosomal apparatus and can cause the 30S subunit of the completed ribosome to misread the genetic code. Polysomes become depleted because the aminoglycosides interrupt the process of polysome disaggregation and assembly.[13]

Dose: 15-22.5mg/kg/day in 2-3 doses (IV)

Amoxicillin

Class: Penicillin

Dose: 20-50mg/kg/day, 3-4 doses (Oral)

Amoxicillin clavulanate

Class: Penicillin + beta - lactamase inhibitor

Mechanism of action: works by inhibiting the formation of bacterial protective covering or cell wall which is fundamental for the survival of the bacteria. By doing so, the medicine kills the infection causing bacteria and prevents the infection from spreading without making them resistant to further treatment. Clavulanic acid (a beta-lactamase inhibitor) restablishes the activity of Amoxicillin against bacteria resistant to Amoxicillin.[14]

Dose: 40 mg/kg/day (Amoxicillin) in 2 doses. 90mg/kg if Penicillin resistant *S.pneumoniae* suspected in otitis media 100 mg/kg/day (Oral).

Cefpodoxime

Class: Cephalosporin

Mechanism of action: The bactericidal activity of Cefpodoxime results from its inhibition of cell wall synthesis. The active metabolite of Cefpodoxime binds preferentially to Penicillin binding protein 3, which inhibits production of peptidoglycan, the primary constituent of bacterial cell walls.

Cefixime

Class: Cephalosporin

Mechanism of action: binds to specific Penicillin-binding proteins (PBPs) located inside the bacterial cell wall, causing the inhibition of the third and last stage of bacterial cell wall synthesis.

Dose: 15 mg/kg/day in 2 divide doses, 20mg /kg /day in 2 divided doses for enteric fever (Oral).

Ceftriaxone

Class: Cephalosporin

Mechanism of action: Selectively and irreversibly inhibits bacterial cell wall synthesis by binding to transpeptidase / transamidases, which are Penicillin binding protein that catalyze the cross linking of the peptidoglycan polymers forming the bacterial cell wall.[15]

Dose: 50-100 mg/kg/day in 2 divided doses. Meningitis 100mg /kg/day in 2 divided doses (IV).

Co-Trimoxazole

It is the combination of sulfamethoxozole and Trimethoprim.

Class: Sulfonamides + Anti-folate antibiotics

Mechanism of action: Sulfamethoxazole works directly on the synthesis of folate inside microbial organisms, e.g., bacteria. Sulfamethoxazole achieves this directly as a competitor of p-aminobenzoic acid (PABA) during the synthesis of dihydrofolate via inhibition of the enzyme dihydropteroate synthase. Trimethoprim is a direct competitor of the enzyme dihydrofolate reductase, resulting in its inhibition, which halts the production of tetrahydrofolate to its active form of folate. The combination of these two agents is meant to create a synergistic anti-folate effect; tetrahydrofolate is a necessary component for synthesizing purines required for DNA and protein production.[16]

Dose: 5-10mg/kg/day in 2 divided doses (5-10 mg Trimethoprim) 20mg /kg/day in 4 divided doses in *Pneumocystis jirovecii pneumonia* (Oral).

Macrolides are old and well-established class of antimicrobial orally effective with high therapeutic index and the drug given is

Erythromycin

Class: Macrolide

Mechanism of action: binds irreversibly to a site on the 50S subunit of the bacterial ribosome, thus inhibiting the translocation steps of protein synthesis. They may also interfere at other steps, such as transpeptidation. Generally considered to be bacteriostatic, they may be bactericidal at higher doses.[17]

Dose: 40 mg in 4 divided doses

Azithromycin

Class: Macrolide

Dose: 10 mg/kg/day OD, enteric fever 20mg/kg OD (Oral)

Metronidazole

Class: Nitroimidazole

Mechanism of action: Some anaerobic protozoal parasites (including amoebas) possess ferrodoxin-like, low-redox-potential, electron-transport proteins that participate in metabolic electron removal reactions. The nitro group of metronidazole is able to serve as an electron acceptor, forming reduced cytotoxic compounds that bind to proteins and DNA, resulting in cell death.[18]

Dose: 7.5mg/kg/day dose TID (Oral, IV)

Piperacillin and Tazobactam is the next most commonly prescribed.

Class: Penicillin + beta-lactamase inhibitors

Mechanism of action: Broad spectrum Penicillin exerts bactericidal activity by inhibiting septum formation and cell wall synthesis of susceptible bacteria. Tazobactam is beta lactamase enzyme inhibitors.[19]

Dose: 200-400mg/kg/day in 3-4 divided doses (IV)

Another frequently prescribed drug is

Rifaximin

Class: Rifamycin

Mechanism of action: Rifaximin is a poorly absorbed bactericidal rifampicin derivative, which inhibits bacterial protein synthesis by irreversibly binding to RpoB, the beta-subunit of the bacterial DNA-dependent RNA polymerase.[20]

Antimicrobial Prescribing: Good Practice

The minimal requirements for the proper examinations in each case of infection suspicion is identification, prognosis, and monitoring of infections.

Use more potent, safe, and affordable antibiotic for the specific amount of time which is required to treat or stop an infection.

The following steps are recommended before prescribing

a. Considering which organism is likely to cause the disease.
b. Observe the clinical diagnosis and other steps to be taken into consideration to reach diagnostic precision.
c. Whether the antimicrobial agents are available and active against the presumed cause of the illness. Also check for the range of antimicrobial activity appropriate and what information should be available for the likelihood of drug resistance.
d. Checking for factors, which will affect choice of drug and dose e.g. renal function, interactions, allergy, pregnancy and lactation.
e. Checking the appropriate dose prescribed. If uncertain, contact Infectious Diseases Physician or clinical microbiologist. Alternatively, check in the formulary.
f. Examine the treatment duration.
g. Whether the treatment is appropriate.

Empiric Therapy is considered if the causative agent is not known and if delay in initiating the therapy would be life threatening. Before considering antimicrobial therapy following points should be taken into consideration:

- To not hurry to treat the infection and all possible microbial causes must be identified using the necessary specimen before starting the therapy.
- Consider possible interaction with other drug.
- Reviewing regularly the accuracy of the diagnosis and treatment altered/stopped when microbiological results become available.
- Using less costly drugs where possible.

To consider for treatment with antibiotic combinations

In order to avoid antagonism side effects between drugs it is advisable to use a single drug wherever possible. There are situations however, when the use of antibiotic combination is desirable such as investigation of an obscure illness, preventing the development of bacterial resistance in long term therapy, achieving synergistic effect. The choice of the drug should be that they act synergistically. The following combinations are synergistic:

1. Aminoglycoside and beta–lactam antibiotic.
2. Beta –lactam antibiotic and beta–lactamase inhibitor.
3. Beta –lactam antibiotic and Glycopeptide (Vancomycin/Teicoplanin)
4. Sulfamethoxazole and Trimethoprim.[21]

AIM AND OBJECTIVES

To assess the prescribing pattern of antibiotics in paediatric with infections.

MATERIALS AND METHODS

Study design

This study was a hospital based prospective observational study.

Duration of the study

The study was carried out for a period of 6 months.

Study population

The study was done in the department of Paediatric of a tertiary care hospital. The data was collected from the patients admitted in the Paediatric ward over six months.

Sampling method

Convenience sampling

Study criteria

Inclusion criteria

- Inpatient.
- Both the genders.
- Patients aged below 12 years.
- Patients whose caretakers are willing to give consent.

Exclusion criteria

- Patient caretakers who are unwilling to give consent.
- Age group more than 12 years of age.
- Patients who are who are not prescribed with antibiotics.

Sources of data

a) Patient case sheet
b) Prescriptions
c) Culture sensitivity report
d) Guardian interview

Sampling size

Based on convenience sampling, the sample size was found to be 120.

Study procedure

Considering the inclusion and exclusion criteria, patients were enrolled after taking written consent from each patient's caretaker. A suitably designed data collection form was used to collect all the necessary information from the paediatric ward of tertiary care hospital. The data collection included the following details:

- Age, gender of the patient.
- Complaints on admission
- Past medical and medication history
- Name and class of drugs prescribed
- Dose, Frequency and route of administration of drug
- Laboratory investigations including culture sensitivity reports
- Current status and clinical progress of the patient.

Statistical analysis

Descriptive analysis was carried out and data was grouped into frequencies and percentages using Microsoft Excel 2019.

RESULTS

Gender distribution

The gender wise distribution of the study population were out of 120 cases of paediatric patients, 79(66%) were male and 41(34%) were female.

Table 1: Gender distribution.

Gender	Frequency	Percentage (%)
Male	79	66
Female	41	34
Total	120	100

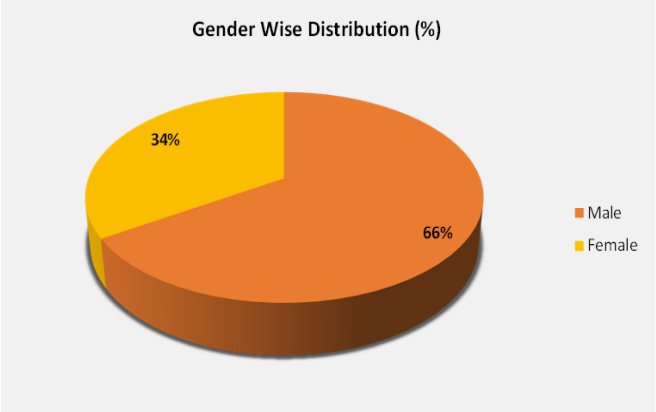

Figure 1: Gender distribution.

Age distribution

Out of 120 paediatric patients most of them belonged to age group of 1 month – 2 years i.e 68 (57%) patients, followed by 50 (42%) children belonging to the age group of 2-12 years and ultimately neonates were 2 (1%) in the range of 0-30 days.

Table 2: Age distribution.

Age group	Age	Frequency	Percentage (%)
Neonates	0-1month	2	2
Infants	1month-2years	68	56
Children	2-12years	50	42
	Total	120	100

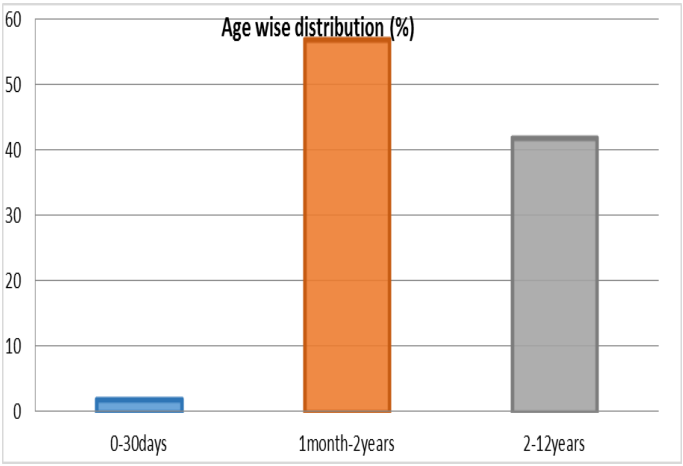

Figure 2: Age distribution.

Diagnosis of the disease

Out of 120 Paediatric cases the most diagnosed disease was wheeze associated respiratory tract infection 39(33%), followed by Lower Respiratory Tract Infection 37 (31%), Upper Respiratory Tract Infection 10 (8%), Viral Pneumonia 6 (5%), Acute Gastroenteritis, Broncho pneumuonia and Urinary Tract Infection with 3(2%) patients and Viral Upper Respiratory Tract Infection, Broncholitis, Otitis Media, Right Upper Lobe Pneumonia, Bronchitis, Acute Respiratory Infection, Sepsis with 2 (2%) patients each and Mysentric Lymphadenitis, Bacterial Meningitis, Bacterial ASOM, Acute Membranous Tonsillitis, Viral Fever with 1(1%) Paediatric patient each.

Table 3: Diagnosis of the disease.

Disease	Frequency	Percentage (%)
Lrti	37	31
Urti	10	8
Walrti	39	33
Bacterial meningitis	1	1
Uti	3	3
Acute gastroenteritis	3	3
Viral pneumonia	6	5
Bronchiolitis	2	2
Bronchopneumonia	3	3
Acute respiratory infection	2	2
Viral fever	1	1
Viral urti	2	2
Mysentric lymphadenitis	1	1
Acute membraneous tonsilitis	1	1
Bilateral asom	1	1
Otitis media	2	2
Bronchitis	2	2
Right upper lobe pneumonia	2	2
Sepsis	2	2
Total	120	100

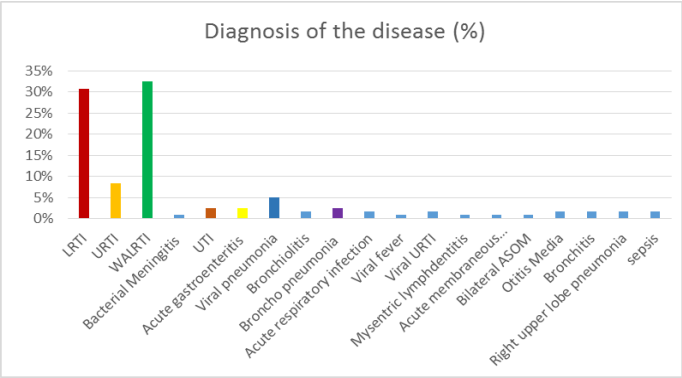

Figure 3: Diagnosis of the disease.

Route of administration

Out of 120 Paediatric cases, majority of the patients were prescribed with Intravenous route i.e. 116 (97%) it is the most effective among other route of administration because it directly enters the systemic circulation without under going first pass metabolism. Rest of the patients were prescribed with the oral route i.e 4 (3%).

Table 4: Route of administration.

Route of administration	Frequency	Percentage (%)
oral	4	3
Intravenous	116	97
Total	120	100

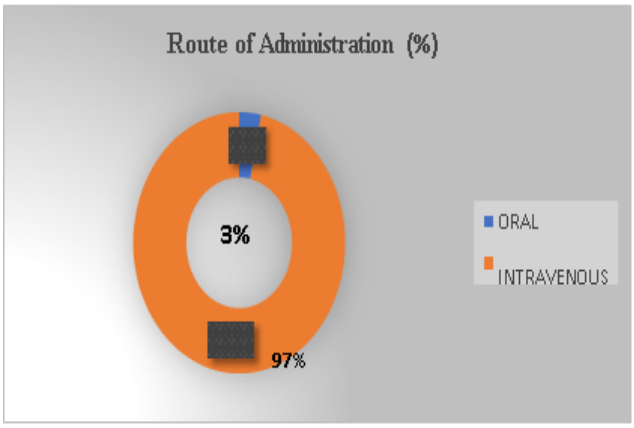

Figure 4: Route of administration.

Length of stay

Out of 120 hospitalised Paediatric patients, the maximum number of days the patients continued to stay in the hospital was 2 days observed in 55 (66%) patients, followed by 3 days in 22 (18%) patients.

Table 5: Length of stay.

Length of stay	Frequency	Percentage
1day	19	16
2days	66	55
3days	22	18
4days	9	7
5days	3	3
>5days	1	1
Total	120	100

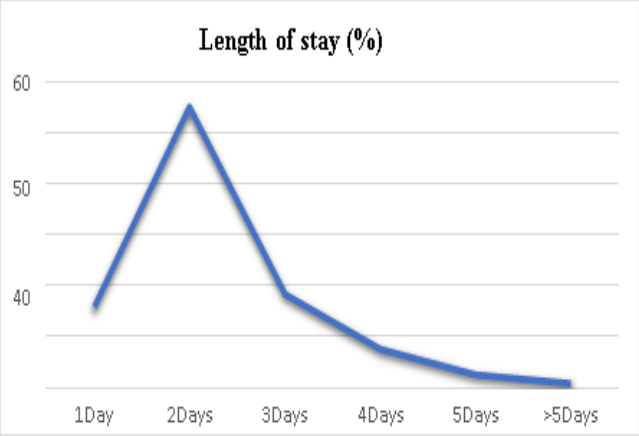

Figure 5: Length of stay.

Culture testing

Out of 120 cases culture testing was done only in 15 (12%) of the patients. While it was not done in majority 105 (88%) of Paediatric patients. Among them 7 (47%) tested positive while 8 (53%) tested negative.

Table 6: Culture testing.

Culture testing	Frequency	Percentage (%)
Yes	15	12
No	105	88
Total	120	100

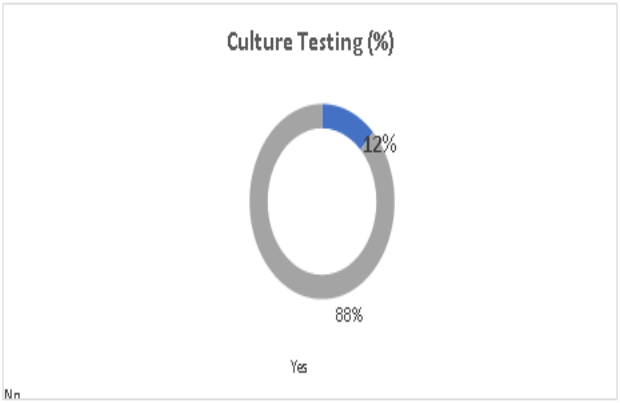

Figure 6: Culture testing.

Class of antibiotics

Among 120 cases the most used Antibiotics was Penicillin with 90 (73%) followed by Cephalosporin 20 (16%), Aminoglycoside 7 (6%), Macrolide 4 (3%), Nitroimidazole and Rifamycin 1(1%).

Table 7: Class of antibiotics.

Class of antibiotics	Frequency	Percentage (%)
Penicillin	90	73
Macrolide	4	3
Cephalosporin	20	16
Aminoglycoside	7	6
Nitroimidazole	1	1
Rifamycin	1	1
Total	120	100

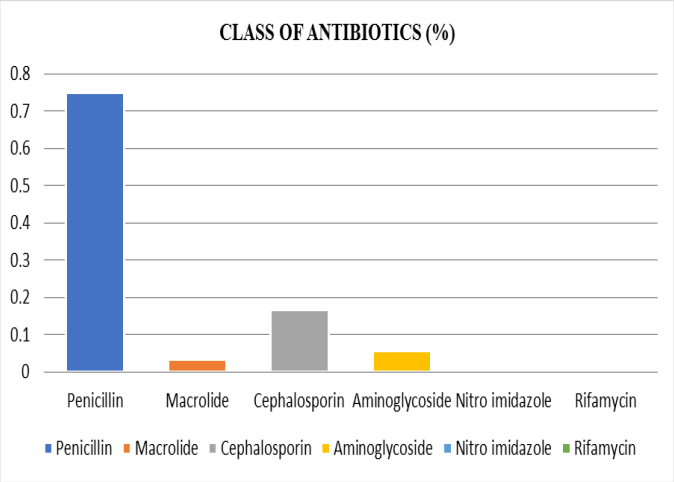

Figure 7: Class of antibiotics.

Combination of drugs

Among 120 cases the combination of drug used most commonly was Amoxicillin and Potassium clavulanate (78%) patients and Piperacillin and Tazobactam (22%).

Table 8: Combination of drugs.

Combination of drugs	Frequency	Percentage(%)
Amoxicillin + potassium Clavulanate	35	78
Piperacillin + tazobactam	10	22
Total	45	100

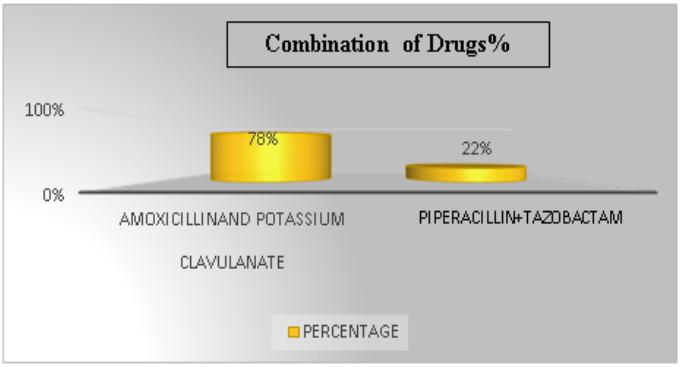

Figure 8: Combination of drugs.

Antibiotics used

Out of 120 Paediatric Cases, the most prescribed antibiotic was Amoxicillin in 51(39%), Cefpodoxime 14(11%), Amikacin 10 (7%), Ceftriaxone 4 (3%), Azithromycin and Trimethoprim 3 (2%) and 1 (2%) respectively. Cefixime 2 (1%) and Erythromycin, Rifaximin, Metronidazole were used in 1(1%).

Table 9: Antibiotics used.

Antibiotic used	Frequency	Percentage
Amoxicillin	51	39
Amoxicillin+clavulanic acid	34	26
Piperacillin+tazobactam	10	7
Azithromycin	3	2
Cefpodoxime	14	11
Trimethoprime	1	2
Amikacin	10	7
Erythromycin	1	1
Cefixime	2	1
Ceftriaxone	4	3
Rifaximin	1	1
Metronidazole	1	1
Total	132	100

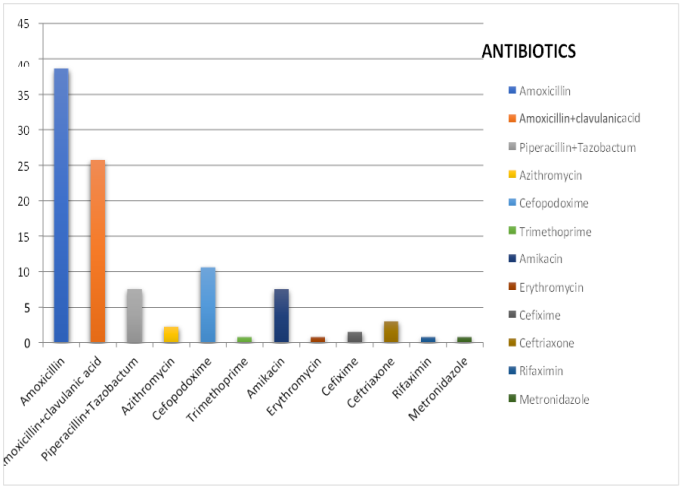

Figure 9: Antibiotics used.

Number of antibiotics per prescription

Out of 120 Paediatric patients, 108 (90%) patients were prescribed with one antibiotic and 12 (10 %) of the patients were prescribed with more than one antibiotics.

Table 10: Number of antibiotics per prescription.

Number of antibiotics per prescription	Frequency	Percentage
More than one	12	10
One	108	90
Total	120	100

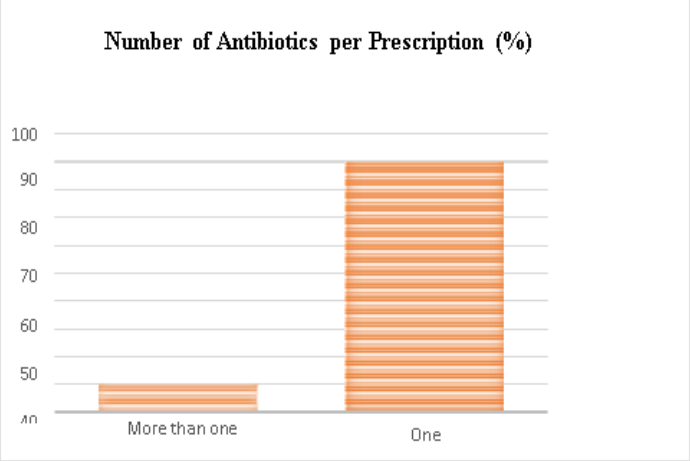

Figure 10: Number of antibiotics per prescription.

Antibiotics prescribed by name

Out of 120 Cases, majority of paediatrics 97% were prescribed with brand named drugs and only 3% were prescribed with generic named drugs.

Table 11: Antibiotics prescribed by name.

Antibiotics prescribed by name	Frequency	Percentage
Generic name	4	3
Brand name	116	97
Total	120	100

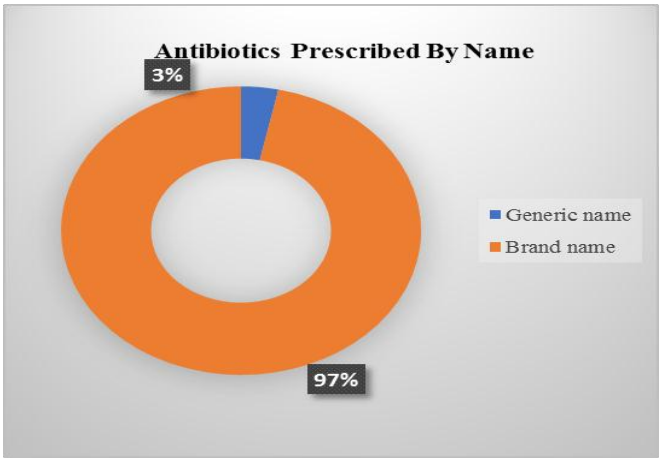

Figure 11: Antibiotics prescribed by name.

Duration of antibiotic treatment

Out of 120 Paediatric patients, the maximum period of treatment provided was for 3 days (51%) followed by 2 days (27%) and least was 1 (1 %) with more than 5 days treatment.

Table 12: Duration of antibiotic treatment.

Duration of antibiotic treatment (days)	Frequency	Percentage
1	2	2
2	32	27
3	62	52
4	12	10
5	11	9
>5	1	1
Total	120	100

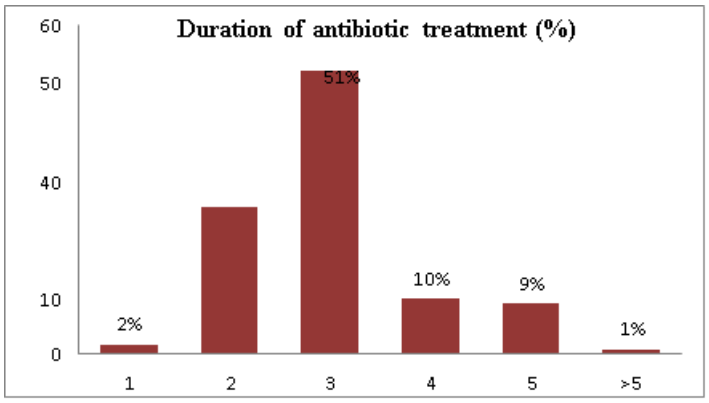

Figure 12: Duration of antibiotic treatment.

Who indicator

Table 13: Who indicator.

Indicator	Percentage
Average number of drugs per encounter	5.16% (620)
Percentage of antibiotics prescribed	1.47% (177)
Percentage of antibiotics with an injectable	97% (116)
Percentage of antibiotics with generic names	3% (4)
Percentage of antibiotics prescribed from hospital formulary	100%

DISCUSSION

During the study period of 6 months, a total of 120 paediatric patients were evaluated. Out of which 79 were male and 41 were female. The percentage of male and female was 66% and

34% respectively. Similar gender distribution was found from the study by Jangara Sarita et al., where the age distribution revealed that majority were male 66.66% and minor cases were of female 33.33%. The discovery of stronger Th1 immune responses in females can explain some of the difference in pathogen susceptibility between genders, but higher level of proinflammatory immunity also predispose females to greater immunopathology in specific illness.[5]

When analysed according to the age distribution, higher number of paediatric patients belonged to the age group of 1 month to 2 years i.e 57%. According to the study by Satyajit Mohapatra et al., infants are most vulnerable population to contract illness thus this age group is majorly prescribed with antimicrobials followed by children (2- 12 years) 42% and least percentage was observed in neonates with 1.7%.[3]

Penicillin class of drugs was prescribed for 73% among paediatric patients. Similar study by Ananditha Sharma Kopparthy et al., showed that 34.5% Penicillin class of drugs were commonly prescribed followed by 20.9% Macrolide class. Among the drugs of the class Penicillin, Amoxillin is at the top of the list of most commonly prescribed paediatric medication. It is an antibiotic which is inexpensive and well-tolerated by most of the children. According to study by Elisa Barbieri et al., Amoxicillin prescriptions decreased with increasing children's age.[29][31]

Among combination of antibiotics, Amoxicillin + Clavulanic acid with (72%) and (22%) Piperacillin +Tazobactam were found to be commonly prescribed for Paediatric patients. Similarity was seen in the study by K. Simon Raju et al., where 47 prescriptions of Amoxicillin + Clavulanic acid and 41 prescriptions of Piperacillin + Tazobactam were found. The reason behind Amoxicillin and Clavulanic acid combination being most preferred is that Clavulanic acid belongs to a class of medication called as beta-lactamase inhibitors. It works by preventing bacteria from destroying Amoxicillin. Similar activity is observed in Piperacillin + Tazobactam.

Out of 120 cases reviewed, analysis of disease pattern revealed that most of the children suffered from Lower respiratory tract infection (63%) where, 39 (33%) was wheeze associated lower respiratory tract infection. Paediatrics are more prone to various bacterial infection particularly respiratory tract infections because their respiratory system will not be fully developed and their inherent immunity diminishes within months after birth. Similar

concept was seen in the study of Satyajit Mohapatra et al., with the majority cases of respiratory tract infections.

Culture testing was done only in 15 (12%) patients while it was not done in majority 105 (88%) of Paediatric patients. Among them 7 (47%) tested positive while 8 (53%) tested negative. Similar result was seen in the study by Sweta Shrestha et al., where among 390 cases only 42.30% were sent for culture test to identify pathogen and among them only13 showed positive culture report.[3]

In our study, the average length of stay was 2-3 days for 66 (55%) patients, followed by 3 days for 22 (18%) patients. This concludes that the average length of stay of Paediatric patients in the hospital was 2-3 days. Reduction in the number of inpatient days results in decreased risk of hospital acquired infections and medication side effects, improvement in the quality of treatment, and increased hospital profit with more efficient bed management.

Majority of the drugs were given by intravenous route (97%) followed by the oral route (3%) which was similar to the study conducted by Hemamalini et al., Intravenous route is the most effective among other route of administration because it directly enters the systemic circulation without undergoing first pass metabolism. Rest of the patients were prescribed with the oral route. This mainly indicates that patients in wards necessarily require the Intravenous route for urgent control of infections and to minimize morbidity as compared to oral route.[27]

Out of 120 Paediatric cases 116 (97%) patients were prescribed with brand name and very least i.e. 4 (3%) prescriptions contained generic name. The hospital in which the study was conducted preferred prescribing in brand name over generic name. Opposite was seen in the study by Vipul Prajapati et al., here out of 350 prescriptions 83.43% were prescribed by generic name while 16.52% were prescribed by the trade name.[23]

Out of 120 cases, 108 (90%) patients were prescribed with one antibiotic and 12 (10%)of the patients were prescribed with more than one antibiotic. This showed that the highest number of patients were mildly infected so they were prescribed with one antibiotic. Similarity was observed in the study conducted by Haroledpeter P.L et al., where the majority of prescriptions contained only one antibiotic (47.80%) out of 159 paediatric patients.[32]

The maximum period of treatment provided for 120 paediatric patient was for 3 days (51%) followed by 2 days (27%) and least was 1(1%) with more than 5 days treatment. This showed that the type of bacterial infection being treated is of varying intensity. Sometimes the shorter treatment course worked just as longer treatment. The usual antibiotic treatment duration starts with a period of 3 days.

Most of the drugs used among 120 paediatric patients were of broad therapeutic index. The most manageable way to restore health back to its best is by choosing broad spectrum as they are flexible and most effective against various types of gram-positive and negative bacteria when compared to narrow therapeutic index drugs.

According to WHO Indicator average number of drugs prescribed per prescription was 5.16 % which was more when compared to the study conducted by Nalini GK et al., was found to be 3.5 %. The percentage of antibiotics prescribed were 1.47%, in which injectable were 97%. Drugs prescribed by the generic names were only 3%. However the brand names are prescribed more which will wear off the essential medical concept. The percentage of antibiotics prescribed from hospital formulary was 100%.

CONCLUSION

According to the result of the study, wheeze associated respiratory tract infection was most common disease among the paediatric patient, age group of 1month - 2 years. The frequently prescribed medication was from the class of Penicillin, among them Amoxicillin was the most commonly prescribed. Maximum percentage of patient were male. Intravenous route use was the most preferred route of administration. Cost of long-term use of parenteral medications and shift to equivalent oral dose should be considered whenever possible.

In most of the cases, culture sensitivity test was not performed as part of the prescribed treatment plan, which could result in the overuse or misuse of antibiotics. Antibiotic resistance causes treatment outcomes to decline, which raises morbidity and mortality rates. Regular audit, training and evidence based new treatment protocol are recommended which can improve healthcare.

In our study all the positive reports did not show the organism responsible for infection. In point of fact many culture was reported without mentioning the organism. Specimen collection is one of the vital process which help us to identify the causative organism and

help determine the most effective therapy.

Study highlighted that the antibiotic prescribed in the paediatric ward of tertiary care hospital was mostly Broad spectrum and the antibiotics were prescribed according to hospital guidelines.

Empirical therapy and antimicrobial usage for viral infection can be reduced by the availability of rapid diagnostic method to differentiate between viral and bacterial infections. Development of guidelines for antibiotic prescription and use of appropriate drugs for disease can result in minimizing the unfavourable use of antibiotics in children.

Limitations

- This study is limited to only one institute and therefore the study could not be generalized.
- The patients were selected as per convenience sampling and therefore could be prone to bias.
- Limited sample size and duration of the study.
- The study only included the population falling under an age group and only one class of drugs due to time constraint.
- Some data required for the study was not available in the medical folder including laboratory investigation and culture reports.

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