Research Article

A Study on Prescribing Pattern of Antibiotics for Respiratory Tract Infection in Pediatric Outpatient in A Tertiary Care Hospital: A Prospective Observational Study

Beya Baby[1*], Anjalimol P.T[1], Arya Suresh[1], Arya Thampi[1], Melody Rose Vijay[1], Sneha Saira Jiji[1], Suryasnata Das[2], Irfanul Haque[3], S Haja Sherief[4]

[1*]Pharm D Intern, Nandha College of Pharmacy, Perundurai, Erode, Tamil Nadu, India.
[2]Department of Microbiology, Jaypee Hospital, Noida, Uttar Pradesh, India.
[3]Department of Clinical Pharmacology, Jaypee Hospital, Noida, Uttar Pradesh, India.
[4]Department of Pharmacy Practice, Nandha College of Pharmacy, Perundurai, Erode, Tamil Nadu, India.
***Corresponding author's E-mail:** beyamariya@gmail.com

Received: 05-09-2019; **Revised:** 18-10-2019; **Accepted:** 26-10-2019.

ABSTRACT

The antimicrobials emerged as a turning point in the reduction of the burden of infectious disease in the 20th century. Among antimicrobials antibiotic are most widely prescribed therapeutic agent across the world. The use of antibiotics in children is different from adult due to difference in pharmacokinetics, pharmacodynamics, efficacy, etc. Antibiotic used against many diseases are rapidly losing their effectiveness and organisms develop resistance to them. Therefore, antibiotics should be used very carefully in appropriate dose and should be prescribed rationally. Rational prescription of antibiotics is very important to avoid treatment failure, non-compliance, multiple drug resistance and increased cost of treatment. The main aim of this study is to find out the prescription pattern of antibiotics for respiratory tract infection in pediatric outpatient. In our study, a greater number of patients have received single antibiotics and most of patients received antibiotics through oral route (syrup). The most widely used antibiotic in this study is penicillin group among penicillin, amoxicillin + clavulanic acid (58%) is more used. Followed by azithromycin, cefpodoxime, clarithromycin, cefotaxime, cefixime, ceftriaxone and least prescribed drug was amoxicillin (0.5%). The total number of drugs and the number of antibiotics prescribed were found to be rational in this study. Hence, the present study concludes that the prescribing pattern of antibiotics in the pediatric outpatients are found to be rational according to guidelines.

Keywords: Pediatric, Respiratory Tract Infection, Antibiotics.

INTRODUCTION

Pediatric is the field of medicine that is concerned with the health of infants, children and adolescents. In worldwide many infectious diseases have be controlled in the 20th century by improving living standard, public health sector and with the use of various antimicrobial agents.[1] Respiratory Tract Infection (RTI) is one of the leading causes of pediatric mortality. According to the data from the office of National Statistics for England and Wales show that RTI accounts for 4% of all deaths in children about the age of 0-4 years.[2] Antibiotics are considered as the key drugs of choice for the treatment of many infections and they are most commonly prescribed drugs in pediatric department for RTI. The indiscriminate use may lead to increased risk of antibiotic resistance.[1]

Many antibiotics are unnecessarily prescribed for viral infections like common cold, even though they are not beneficial. Leading to misuse/overuse of antibiotics.[3] Irrational prescription is a global problem and it may lead to unsafe treatment, exacerbation of the disease, health hazards and economic burden of disease.[4]

According to WHO, antibiotics used against many diseases are rapidly losing their effectiveness, and micro-organisms develop resistance to them. Therefore, antibiotics should be prescribed in appropriate dosage, frequency, route, etc.[5]

Nowadays many pediatricians are including antibiotics as empirical therapy without considering its rationality. The irrational antibiotic may lead to the antibiotic resistance and emergence of "SUPER BUGS" and all these can lead to serious infection. To overcome the above problem, we should assure a safe rational antibiotic prescription by using various antibiotic guidelines.[1]

Rational prescription of antibiotics is very important to avoid treatment failure, non-compliance, multiple drug resistance and increased cost of treatment. Proper diagnosis, effective and safe treatment, selection of appropriate drug, dosage, duration, writing a legible prescription, giving patient adequate information and follow-up to evaluate treatment outcome will ensure the rational drug prescription.[6]

The goal of this study is to achieve a safe and rational medical care to the pediatric patients treating for respiratory tract infection.

MATERIALS AND METHODS

A prospective observational study was conducted in the pediatric outpatient department in a 338-bedded multi-specialty hospital in North India. An about 3 month's data was collected and analyzed as per AMR National Treatment Guidelines and NICE International Guidelines. All the pediatric outpatients up to the age of 14 coming for respiratory tract infection prescribed with antibiotics of

both sexes are included in the study and all the inpatients from ward, PICU (pediatric intensive care unit), NICU (neonatal intensive care unit), adult, geriatric and pregnant patients are excluded from the study. Prescriptions of 200 pediatric outpatients with respiratory tract disease prescribed with antibiotics were reviewed for the study. A data collection form was designed, and the required data was collected from the patient's chart in data collection form. The data included the name, age, weight, identification number, diagnosis, antibiotic name, dose, route, frequency and its appropriateness.

RESULTS

A total of 200 patient's case sheets were reviewed in pediatric outpatient department during 3 months study period in which 89 (44.5%) patients were Females and 111(55.5%) patients were Males. (Figure 1)

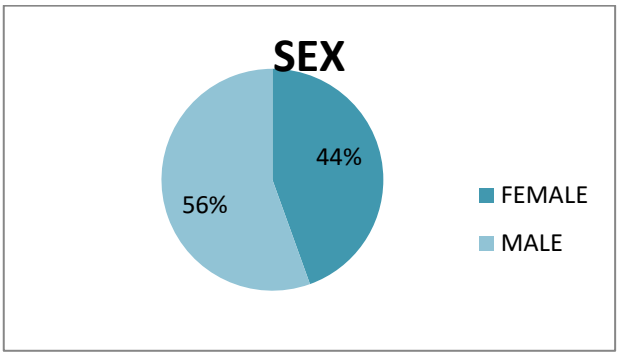

Figure 1: Gender Wise Distribution

Among 200 patients, 89 (44.5%) patients are in between the age of 0-2, 41 (20.5%) patients in between the age of 3-4, 24 (12%) patients are in between the age of 5-6, 23 (11.5%) patients are between the age of 7-8, 11 (5.5%) patients are in between of 9-10, 8 (4%) patients are in the age of 11-12 and 4 (2%) patients are in the age of 13-14 and it shows that more RTI were seen in the age of 0-2 and least in the age of 13-14. (Figure 2)

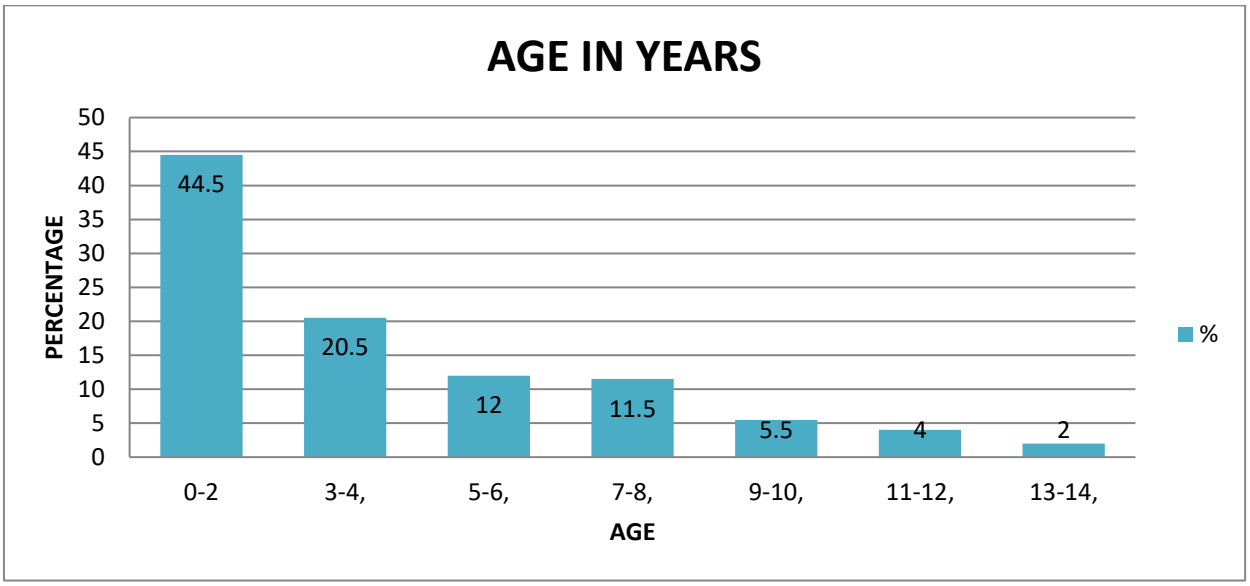

Figure 2: Age Wise Distribution

From the 200 patient's data, studies show that 168 (84%) patients got diagnosed with Upper Respiratory Tract Infection (URTI) and 32(16%) patients got diagnosed with Lower Respiratory Tract Infection (LRTI). (Figure 3)

In this study 109(54.5%) patients were diagnosed with upper respiratory tract infection, 22(11%) patients were diagnosed with tonsillitis, 22(11%)patients were diagnosed with pharyngitis, 12(6%) patients were diagnosed with pneumonia, 9(4.5%) patients were diagnosed with bronchitis, 10(5%) were diagnosed with WALRI and 16(8%) were diagnosed with otitis media. (Figure 4)

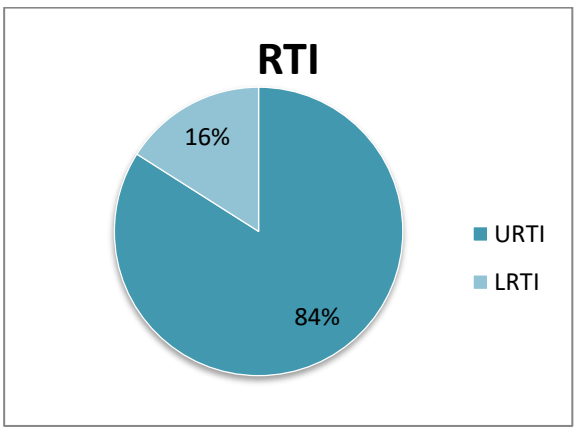

Figure 3: Respiratory Tract Infection

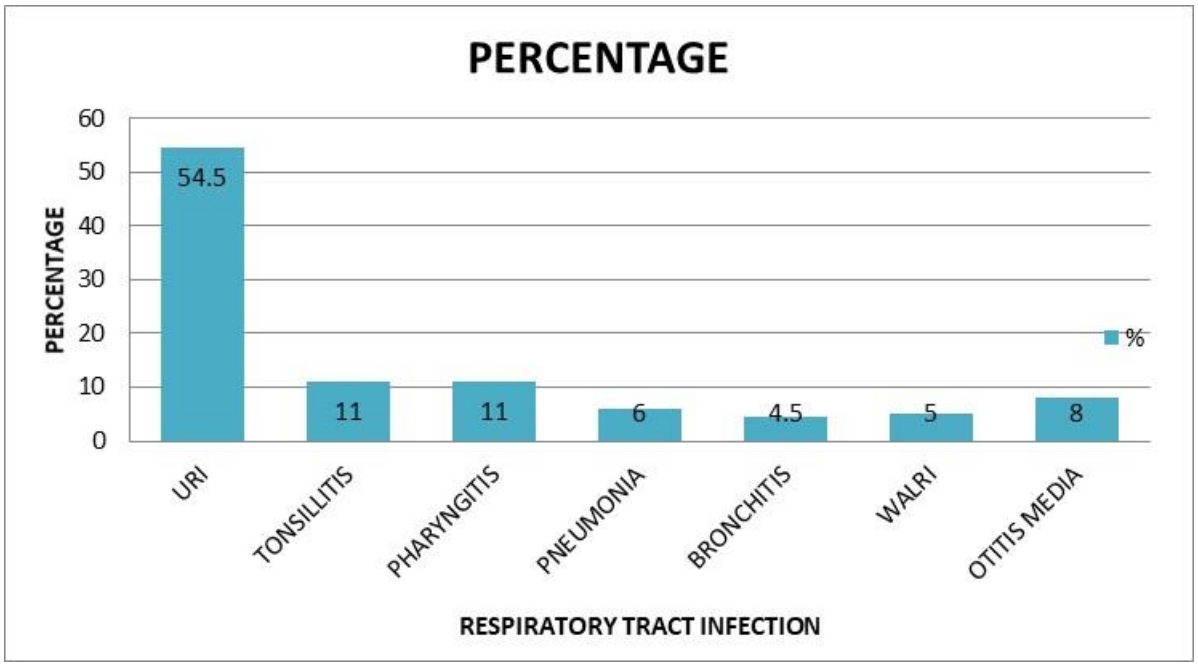

Figure 4: Details on Distribution Pattern of Pediatric Outpatient's Respiratory Tract Disease

Most commonly prescribed antibiotics were penicillin group. Among penicillin, amoxicillin + clavulanate were more prescribed 116 (58%). Followed by azithromycin 53 (26.5%), clarithromycin 8 (4%), cefpodoxime 8 (4%), cefotaxime 6 (3%), cefixime 5 (2.5%), ceftriaxone 3 (1.5%) and least prescribed drug were amoxicillin 1(.5%). (Table 1)

Table 1: Antibiotics Prescribed to the Study Population

Drugs	Number	Percentage
Azithromycin	53	26.5
Amox+Clav	116	58
Amoxicillin	1	0.5
Ceftriaxone	3	1.5
Cefpodoxime	8	4
Clarithromycin	8	4
Cefixime	5	2.5
Cefotaxime	6	3
Total	200	100

Out of 200 patients, 109 patients diagnosed with URI are prescribed with 8 different types of antibiotics. They are Amoxicillin + Clavulanate (53 patients), Azithromycin (35 patients), Cefpodoxime (5 patients), Cefotaxime (5 patients), Cefixime (4 patients), Ceftriaxone (3 patients), Clarithromycin (2 patients), Amoxicillin (1 patient). 22 patients were diagnosed with tonsillitis and they are given with Amoxicillin + Clavulanate (19 patients), Azithromycin (3patients). 22 patients with pharyngitis got Amoxicillin+ Clavulanate (19 patients), Azithromycin (1 patient), Cefpodoxime (1 patient), Cefixime (1 patient). 16 patients diagnosed with otitis media got Amoxicillin + Clavulanate (14 patients), Azithromycin (1 patient), Cefpodoxime (1 patients). 12 patients diagnosed with pneumonia got Azithromycin (7 patients), Amoxicillin+ Clavulanate (4 patients), Cefpodoxime (1 patients). 10 patients diagnosed with WALRI got Azithromycin (4 patients), Clarithromycin (4 patients), Amoxicillin + Clavulanate (2 patients). 9 patients with bronchitis got Amoxicillin + Clavulanate (5 patients), Azithromycin (2 patients), Clarithromycin (2patients). (Table 2).

Table 2: Distribution Pattern of Types of Antibiotics Prescribed for Respiratory Tract Infections

Disease	Azithro	Amox+clav	Amoxicillin	Ceftriaxone	Cefpodoxime	Clarithromycin	Cefixime	Cefotaxime	Total
URI	35	53	1	3	5	2	4	6	109
Tonsillitis	3	19							22
Pharyngitis	1	19			1		1		22
Pneumonia	7	4			1				12
Bronchitis	2	5				2			9
Walri	4	2				4			10
Otitis media	1	14			1				16
Total	53	116	1	3	8	8	5	5	200

Table 3: Compliance with AMR and NICE International Guidelines

Guidelines	Compliance	Percent (%)	Non-compliance	Percent (%)	Total
Compliance with AMR National Guidelines	104	52	96	48	200
Compliance with Nice International Guidelines	135	67.5	65	32.5	200

In this study we find out the different compliance with different guidelines, they are AMR national guidelines and NICE International guidelines and conclude that 37.5% compliance and 62.5% non- compliance with AMR National guidelines. 52% compliance and 48% non-compliance with NICE International guidelines. (Table 3)

DISCUSSION

In our study, a total of 200 prescriptions containing antibiotics were recorded from pediatric outpatient department. Male pediatric patients were more (55.4%) when compared to female (44.5%). Similar results were found in the studies conducted by Palikhe N (males 61.9% and female38.1%).[3]

More number of patients belonged to the age group of 0-2years.This is very natural because in this age, the children's attitude will be more and immune power will be less. Fewer percentages were observed in the children of age group 13-14 years and it is similar to the study conducted by sayyeri dutta et al.[4]

From the 200 patients data, studies shows that more people were diagnosed with upper respiratory tract 168 (84%) with severe cough, fever, tonsillitis, pharyngitis, otitis media and cold and 32(16%) patients were diagnosed with lower respiratory tract infection like pneumonia, bronchitis and WALRI and a similar study was conducted by Tripti Rani Paul et al.[6]

In our study, a greater number of patients have received single antibiotics and most of the patients received antibiotics through oral route (syrup). The most widely used antibiotic in this study is penicillin group among penicillin, amoxicillin + clavulanic acid (58%) is frequently used. Followed by azithromycin, cefpodoxime, clarithromycin, cefotaxime, cefixime, ceftriaxone and least prescribed drug was amoxicillin (0.5%). A similar study was conducted by Ashok Kumar Malpani et al.[1]

In this study nearly 8 types of antibiotics are prescribed for upper respiratory tract infection with severe cough, fever and cold (Amoxicillin+ Clavulanic acid, Azithromycin, Amoxicillin, Ceftriaxone, cefpodoxime, Clarithromycin, Cefixime, Cefotaxime). Two types of antibiotics are prescribed for tonsillitis (Amoxicillin+ Clavulanic acid and Azithromycin). Four types of antibiotics for pharyngitis (Amoxicillin+ Clavulanic acid, Azithromycin, cefpodoxime and cefixime). Three types of antibiotics for otitis media (Azithromycin, Amoxicillin+ Clavulanic and Cefpodoxime). Three types of antibiotics for pneumonia (Azithromycin, Amoxicillin+ Clavulanic and Cefpodoxime). Three types of antibiotics for WALRI (Azithromycin, Amoxicillin+ Clavulanic and Clarithromycin). Three types of antibiotics for bronchitis (Azithromycin, Amoxicillin+ Clavulanic and Clarithromycin).

In this study, we find out the different compliance with different guidelines, they are AMR national guidelines and NICE International guidelines. And find out that prescriptions are more compliance to NICE international guidelines (67.5%) and 52% compliance with AMR National guidelines.

CONCLUSION

The present study reveals that the most commonly prescribed antibiotic class was penicillin and macrolides. The most commonly prescribed antibiotics were amoxicillin + clavulanic acid followed by azithromycin. The commonly diagnosed diseases are URTI and fever followed by tonsillitis and pharyngitis (84.5%) and only few LRI were seen in this study (15.5%). The total number of drugs and the number of antibiotics prescribed were found to be rational. Hence, the present study concludes that the prescribing pattern of antibiotics in the pediatric outpatients is found to be rational according to guidelines.

Acknowledgement: We would like to express our sincere gratitude to everyone who has guided and trained in completing our project.

REFERENCES

1. Malpani AK, Waggi M, Rajbhandari A, Kumar GA, Nikitha R, Chakravarthy AK. Study on prescribing pattern of antibiotics in a pediatric out-patient department in a tertiary care teaching and non-teaching hospital. Indian Journal of Pharmacy Practice. 2016, 253-259.
2. Paul SP, Wilkinson R, Routley C. Management of respiratory tract infections in children. Nursing: Res Rev. 2014,135-148.
3. Palikhe N. Prescribing pattern of antibiotics in pediatric hospital of Kathmandu valley. Journal of Nepal Health research council. 2008.
4. Sayeri dutta, Abhishek bhattacharjee, N. Meena devi. prescription pattern of antibiotics in paediatric inpatients at a tertiary care hospital in north east india.2017,2384-2387.
5. https://www.who.int/bulletin/volumes/95/1/16-176123/en/
6. Paul TR, Hamid MR, Alam MS, Nishuty NL, Hossain MM, Sarker T, Hosan Z, Wahed MI. Prescription pattern and use of antibiotics among pediatric out patients in Rajshahi City of Bangladesh. International Journal of Pharmaceutical Sciences and Research. 2018,3964-3970.

Source of Support: Nil, **Conflict of Interest:** None.