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A STUDY ON THE USAGE OF ANTIBIOTICS IN VARIOUS INFECTIONS IN PEDIATRICS

Bincy T. Abraham*, Jean Rachel Samuel and Jeena S.K.

Department of Pharmacy Practice, Grace College of Pharmacy, Kodunthirapully P.O, Palakkad, Kerala-678004, India.

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***Correspondence for Author**
Bincy T. Abraham
Department of Pharmacy Practice, Grace College of Pharmacy, Kodunthirapully P.O, Palakkad, Kerala-678004, India.

ABSTRACT

A prospective observational study was conducted by collecting data from pediatric patient's case records and thereby an assessment was done on the usage of antibiotics in treating various infections among pediatrics. Data was collected from a total of 90 pediatric patients, out of this 41.1% (n = 37) were male and 58.8% (n = 53) were female. Out of the total, 71.1% (n = 64) were children, 17.7% (n = 16) were adolescents and 10% (n = 9) were infants. The clinical condition for which antibiotics were prescribed in the highest rate was respiratory tract infection that accounted for 43.3% (n = 39) cases followed by fever in 23.3% (n = 21) cases and gastrointestinal tract infection in 18.8% (n = 17) cases and urinary tract infection in 5.5% (n = 5) cases. And most of the patients with Respiratory tract infection received monotherapy with antibiotic Amoxicillin which accounted for 28.2% (n = 11) cases followed by dual therapy with Ceftriaxone + Amikacin in 15.4% (n = 6) cases. The patients affected by gastro intestinal tract infection were commonly prescribed with the antibiotic Metronidazole as a monotherapy in 11.8% (n = 3) cases and a dual therapy of Metronidazole + Amoxicillin in 17.6% (n = 3) cases. While those suffering with Urinary tract infection were treated with Norfloxacin in 60% (n = 3) cases and a combination treatment regimen with Ciprofloxacin + Ampicillin in 40% (n = 2) cases [Figure 9, Table 9]. Out of 21 patients affected by fever, 42.8% (n = 9) cases were given monotherapy with amoxicillin and 9.5% (n = 2) cases were treated with a combination regimen of Ceftriaxone + Ciprofloxacin.

KEYWORDS: Antibiotic, pediatrics, respiratory tract infection, urinary tract infection.

INTRODUCTION

Antibiotics are chemical substance produced by a microorganism which in dilute concentration has the capacity to kill bacteria or inhibit their growth.[1-2] Since the 1930s, antibiotics have been used to treat many bacterial infections occurring in humans, animals and plants. Aminoglycosides are used to treat gram-negative bacteria as in pneumonia, typhoid infections. It's side effects include damage to ears and kidneys that may pose a risk to foetus if the drug is taken during pregnancy.[3] Penicillins are used to cure skin infections, ear infections, respiratory tract infections, dental infections, urinary tract infections and gonorrhea. Penicillins can be combined beta-lactamase inhibitors to provide protection against resistance.[4]

Sulfonamides or sulfa drugs functions similar to that of penicillin. These antibiotics effectively treat kidney infections, however, side effects may include damage to the kidneys.[5] So patients are advised to drink lot of water to prevent formation of crystal deposits. Sulfa drugs may also cause increased sensitivity to sunlight. Cephalosporins are used to treat staphylococcal infections, streptococcal throat infections, pneumonia, bronchitis, tonsillitis, otitis, gonorrhea and skin infections. They are also used in surgical prophylaxis.[6] Fluoroquinolones are used to treat skin infections, urinary tract infections and respiratory infections such as bronchitis, pneumonia and sinusitis. This type of antibiotic should not be given to children and pregnant women, since these drugs are known to affect bone growth.[7] Macrolide antibiotics are used in treating soft tissue infections, respiratory tract infections, gastrointestinal infections and genital infections. They are usually used to treat patients who are sensitive to penicillin. Tetracyclines are used to treat malarial infections, chlamydial infections and syphilis. They can also be used for mild acne as well as Lyme disease, Rocky Mountain Spotted Fever, urinary tract infections, sexually transmitted diseases, upper respiratory tract infections and typhus.

Until the 20th century, children were universally considered as small adults and hence they were treated as such.[8] A lack of complete clinical information about the drug led to disasters such as gray baby syndrome with chloramphenicol and phocomelia with thalidomide.[9] Providing effective drug therapy for children remains a challenge in the department of pediatrics as there are marked differences in the pharmacokinetic and pharmacodynamic responses to drugs in the neonatal and pediatric population.[10]

MATERIALS AND METHODS

Study site

The study was conducted at the department of Pediatrics with the consent of director Fr. Julius Arakal cmi under the leadership of Dr. Vidhya Ramdas, Dr. Mohammed Ismail and Dr. Joby Paul in Paalana Institute of Medical Science at Palakkad.

Study period

The study was conducted over a period of six months from May 2011 to November 2011.

Study Design

The study was designed as a prospective observational study to collect various data of paediatric patients and thereby obtain a comprehensive knowledge of usage of antibiotics in treating various infections in paediatrics.

Study population

A total of 90 subjects were included in the study.

Literature Survey

An extensive literature survey was done on usage of various categories of antibiotics in paediatrics that includes Indian Journal of Pharmacy Practice, Official Journal of the American Academy of Paediatrics, British Journal of Clinical Pharmacology, The Annals of Pharmacotherapy and The Canadian Family Physician.

Study criteria

✓ **Inclusion criteria**

All inpatients of the pediatric ward prescribed with antibiotics.

✓ **Exclusion criteria**

- Out-patients
- Patients above 18 years
- Pediatrics who were not prescribed with antibiotics
- Intensive care unit patients.

Development of patient data entry form

A specially designed data entry form was used for collecting patient details. It consists of patient details, signs and symptoms, diagnosis and medication.

RESULT AND DISCUSSION

The study was carried out at Paalana Institute of Medical Sciences over a period of six months from May 2011 to November 2011. During the entire study period, a total of 90 pediatric patients were included: of these 41.1% (n = 37) were male and 58.8% (n = 53) were female.[11-14] [Figure 1]

The data analysis showed that among 90 patients, 71.1% (n = 64) of children followed by 17.7% (n = 16) of adolescents and 10% (n = 9) of infants were prescribed with antibiotic for the treatment of various infections. Similar studies conducted by Misbahuddin et al in 2009 revealed that the incidence of infection was higher in neonates i.e., 42.2%.[15] [Figure 2].

During the study period various clinical conditions treated with antibiotics were identified, among these, the respiratory tract was found to be more commonly affected. Respiratory tract infection was diagnosed in 43.3% (n = 39) cases followed by fever in 23.3% (n = 21) cases, gastrointestinal tract infection in 18.8% (n = 17) cases and urinary tract infection in 5.5% (n = 5) cases. Another study conducted by Jha V et al in 2010 reported that gastrointestinal tract infections accounted for the maximum number of antibiotics.[16] [Figure 3].

The study also revealed that most of the patients with Respiratory tract infection received monotherapy with antibiotic Amoxicillin which is accounted for 28.2% (n = 11) cases followed by dual therapy with Ceftriaxone + Amikacin in 15.4% (n = 6) cases.[17-18] [Figure 4].

The patients affected by gastrointestinal tract infection were commonly prescribed with the antibiotic Metronidazole in 11.8% (n = 3) cases and a dual therapy with Metronidazole + Amoxicillin in 17.6% (n = 3) cases. [Figure 5].

While those suffering with Urinary tract infection were treated with Norfloxacin in 60% (n = 3) cases and a combination regimen of Ciprofloxacin + Ampicillin in 40% (n = 2) cases. [Figure 6].

And out of 21 patients affected by fever, 42.8% (n = 9) cases were given monotherapy with amoxicillin and 9.5% (n = 2) cases were given a combination regimen of Ceftriaxone + Ciprofloxacin. [Figure 7].

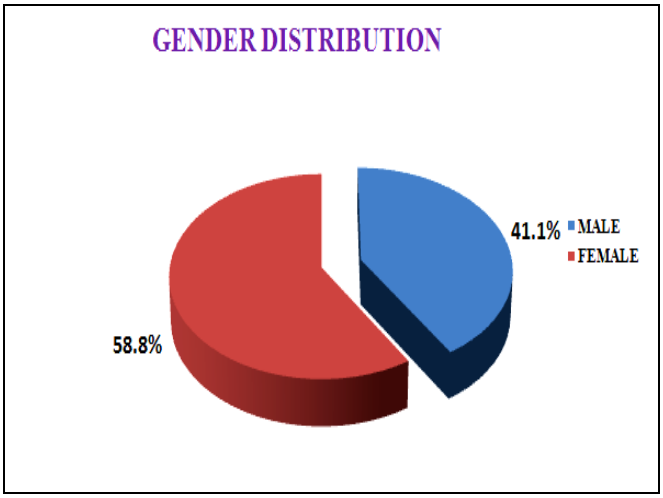

Figure: 1 Gender distribution.

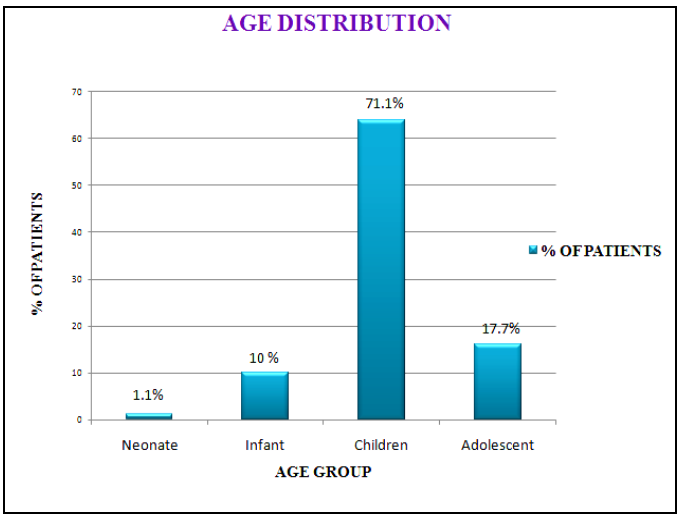

Figure: 2 Age distribution.

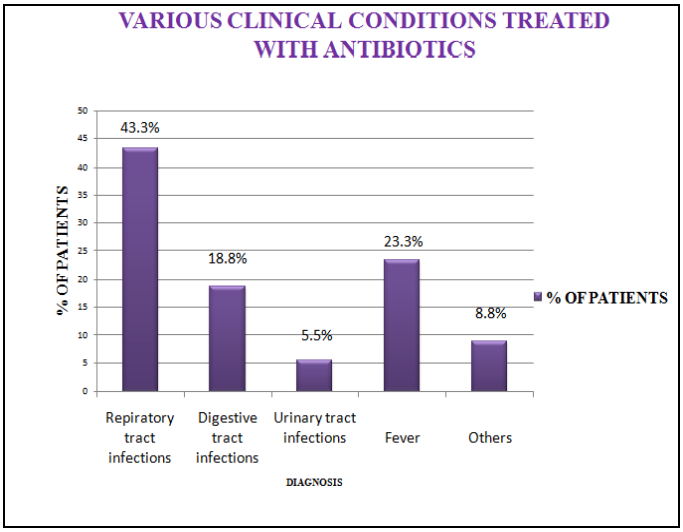

Figure: 3 Various clinical conditions treated with antibiotics.

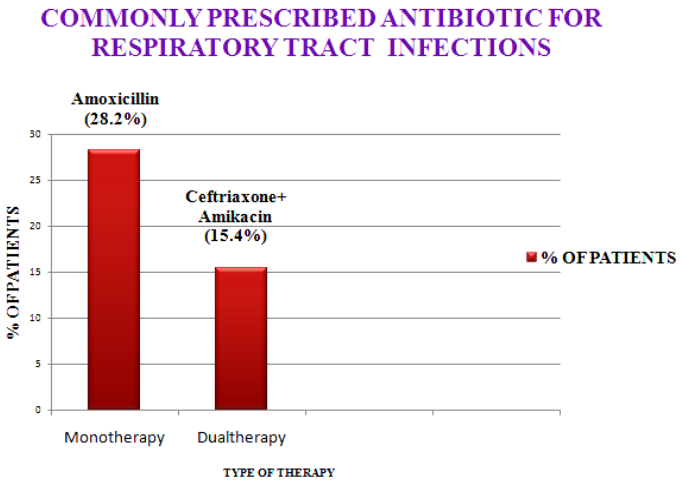

Figure: 4 Commonly prescribed antibiotic for respiratory tract infections.

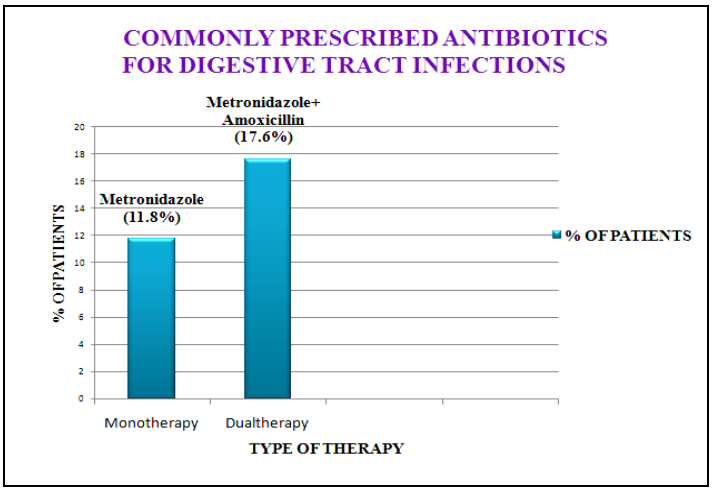

Figure: 5 Commonly prescribed antibiotic for gastrointestinal infections.

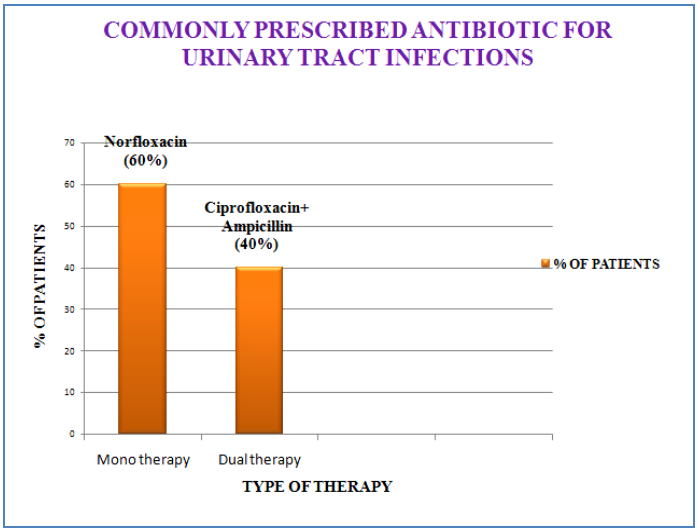

Figure: 6 Commonly prescribed antibiotic for urinary tract infection.

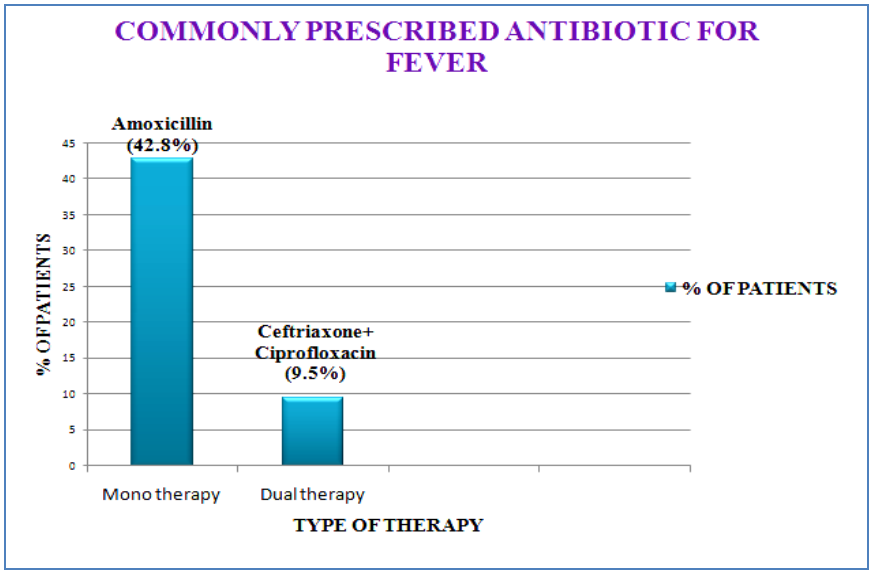

Figure: 7 Commonly prescribed antibiotics for fever.

CONCLUSION

The study concluded that among the various clinical conditions identified, most of the patients were diagnosed with RTI, followed by fever, digestive tract infections and amoxicillin was the most widely used antibiotic to treat Respiratory tract infection, Metronidazole + Amoxicillin in Gastrointestinal infection, Norfloxacin in Urinary tract infection and Amoxicillin was used in Fever.[19-24]

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