

Assessment of Prescription Pattern of Infectious Diseases in Paediatric In-Patients Department of a Teaching Hospital

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ABSTRACT

Background: Pediatric infectious disease was mainly caused by bacteria, viruses, fungi and parasites. Antibiotics are strong and effective medicines, used to treat various infections. When antibiotics were first introduced, they were strong and efficient treatments for different infectious diseases.

Objectives: The objectives were to evaluate prescription pattern of antibiotics in infectious diseases and to identify the common routes of administration and also to identify the drug interactions.

Methodology: A prospective, hospital based study was conducted for a period of six months on 120 Pediatric subjects suffering from infectious diseases. A written informed assent was obtained from all the subject representatives before inclusion in the study. Patient demographics, laboratory data and treatment chart were reviewed. The study results were analyzed by descriptive statistical analysis.

Results: A total of 120 subjects aged up to 12 years data were collected. Out of 120 subjects, maximum number of subjects was admitted due to acute gastroenteritis. The common route of administration was parenteral in that 75% intravenous and 2.1% intramuscular. From this study we found that the most commonly interacting drugs were ceftriaxone + Amikacin (7.1%).

Conclusion: The study reveals that the most common infectious disease was acute gastroenteritis and the common antibiotic prescribed was Cephalosporin class. The common route of administration was Parenteral and the most common drug interactions were found between ceftriaxone + Amikacin.

Key Words: Infectious diseases, antibiotics, route of Administration, drug interactions.

INTRODUCTION

Pediatric infectious diseases are mainly caused by bacteria, viruses, fungi and parasites. Other diseases that are complicated or atypical, including illnesses that are of unclear cause, have prolonged fever, respiratory infections, bone and joint infections, tuberculosis, aids, hepatitis and meningitis. ^[1]

The incidence is especially high in the first 7 years of life and children suffer an average of 6 attacks annually. Infections are the largest cause of morbidity and mortality worldwide. The course and severity of infection depend on a variety of factors, including the virulence of the strain of infecting organism, the resistance of the individual, which may be reduced by famine or inter current disease, social factors such as lack of sanitation, poor housing and contaminated water supply. ^[2]

In recent years, drug prescription studies are found to be useful tool to facilitate rational use of drugs in health care delivery systems. It truly reflects the status of health care system. In order to be rational, use of a drug must be effective, safe, prescribed for the proper therapeutic indication and the correct dosage in an appropriate formulation. ^[3]

Infants and children are among the most vulnerable population groups to contact illness. Infectious diseases in children are in general of viral origin rather than bacteria. Effective medical treatment of pediatric patient is based upon an accurate diagnosis and optimum course of therapy.

The study is conducted on the basis of subject's age, disease condition etc. [4]

Antibiotics are strong and effective medicines, used to treat various infections. When antibiotics were first introduced, they were strong and efficient treatments for different infectious diseases. [5]

Antibiotic treatment is helpful to children only if symptoms persist for 10-14 days without any improvement. New drugs and new modes of treatment are constantly being introduced. The medical care's quality should be judiciously implemented, appropriate, safe, effective and economic. [6]

Optimal and judicious selection of antibiotics for the therapy of infectious diseases requires clinical judgment and detailed knowledge of pharmacological and microbiological factors. [7]

Although awareness of the consequences of antibiotic misuse is increasing, over prescribing remains widespread. It is driven largely by patient demand, time pressure on clinicians and diagnostic uncertainty. If the gains in the treatment of infectious diseases are to be preserved, clinicians must be wiser and more selective in the use of antimicrobial agents. [8]

Prescriptions written by general practitioners and medical specialists were studied and compared to determine the type, time of onset and clinical importance of drug-drug interactions (DDIs) in an attempt to reduce further complications. Potential drug interactions are common in the practice of infection management. [9]

MATERIALS AND METHODS

This is a hospital based prospective study conducted in the pediatric department of Basaveshwara Medical College & Research Centre, Chitradurga for a period of 6 months. A total of 120 subjects from the pediatric department who satisfied the study criteria and assent to participate in this study were included in the study. The complete project was done after obtaining the permission granted by the ethical committee of Basaveshwara Medical College

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Study Criteria

Inclusion Criteria

- Both the genders of male and female.
- Subjects with age up to 12 years.
- Subjects appeared with bacterial infections

Exclusion Criteria

- Exclude pediatric subjects in other departments.
- Exclude subjects with viral infections.

Statistical Analysis

The collected data was entered in Microsoft excel 2013 version and Descriptive method was used for the analysis.

RESULTS

This study was conducted in pediatric subjects with infectious diseases and on antibiotic treatment, who were presented to the in-patient department of the hospital, were reviewed daily.

The study included a total of 120 subjects and the maximum number of subjects comes under the age of 1-5 (21.6%) and minimum number of subjects comes under the age of 11-15 (7.5%).

Table 1: Distribution of subjects according to age

Sl.no	Age group	Total	Percentage (%)
1	Less than 1 year	26	21.6
2	1-5 years	63	52.6
3	6-10 years	22	18.3
4	11-12 years	9	7.5
TOTAL		n=120	%=100

Out of 120 subjects 70 (58.3%) subjects are male and 50 (41.7%) subjects are female.

Table 2: Distribution of subjects according to gender

Sl.no	Gender	Total	Percentage (%)
1	Males	70	58.3
2	Females	50	41.7
TOTAL		n=120	%=100

According to this study Out of 120 subjects, maximum number of subjects are admitted due to acute gastroenteritis. In this study a total of 120 subjects 192 antibiotic

prescription was found. Mostly prescribed antibiotic in our study were cephalosporin's (59.6%) followed by aminoglycosides (16.7%), penicillins (9.9%), macrolides (5.2%), tetracyclines (4.1%), fluoroquinolones (3.6%), β lactamase inhibitors (1%), Antitubercular drugs (1%).

Table 3: Prescription of antibiotics based on the class.

Sl.no	Class of antibiotics	Frequency	Percentage
1	Cephalosporin's	114	59.6
2	Aminoglycosides	32	16.7
3	Penicillin	19	9.9
4	Macrolide	10	5.2
5	Tetracycline	8	4.1
6	Fluoroquinolones	7	3.6
7	β - lactamase inhibitors	1	1

In this study out of 192 prescriptions 44(22.9%) drugs comes under oral route, 144 (75%) drugs comes under intravenous and 4 drugs comes under intramuscular.

Table 4: Distribution of route of administration.

Sl.no	Types of route of administration	Frequency	Percentage (%)	
1	Oral		44	22.9
2	Parenteral	Intravenous	144	75
		Intramuscular	04	2
Total			192	100

And when it comes to drug interaction Out of 192 prescriptions total 32 antibiotic drug interactions are found. In that 2 mild interactions and 30 moderate interactions are found.

Table 5: Distribution of drug interactions.

Sl.no	Type of interaction	Drugs involved	Frequency	Percentage (%)
1	Mild	Piperacillin+Amikacin	02	6.3
2	Moderate	Ceftriaxone Amikacin	25	78.1
		Ampicillin+Amikacin	04	12.5
		Cefotaxime+Amikacin	01	3.1
3	Severe	Nil	Nil	Nil
Total			32	100%

DISCUSSION

Population constitute of about 28% of children and infants who are most susceptible to diseases due to under development of immune system. Several studies reported that 50% to 85% of children receive antibiotics in developed and developing countries prescribed by physicians. The use of antimicrobial agents, especially antibiotics has become a routine practice for the treatment of pediatric illnesses. Antibiotics represent one of the most commonly used drugs in paediatrics ward. Their irrational use leads to a number of consequences in terms of cost, drug interactions, hospital stay, bacterial resistance and increased medication error. [4] In the present study out of 120 subjects maximum number of subjects comes under the age of 1-5 and minimum number of subjects comes under the age of 11-15. A similar study conducted by Reshmi TM et al shows that out of 153 cases maximum number of subjects comes under the age of 1-5 years (52.28%). [10] And also a similar

study conducted by Bansal A et al shows that maximum subjects were between one to five years of age with male predominance. [11]

In the study period antibiotics are the agents prescribed with greater frequency. Out of 120 subjects 114 subjects prescribed with cephalosporin's (59.6%) and least are β - lactamase inhibitors (1%) and Ant tubercular agents (1%). Similarly a study conducted by Babu TK et al shows that cephalosporin's are the mostly prescribed antimicrobial group (40%) followed by β -lactamase inhibitors. [4] A similar study conducted by Jose S et al shows that Among 110 pediatric subjects Mostly prescribed antibiotic in our study were Cephalosporin's 91, followed by Amino glycosides, Penicillin's, Macrolide, Fluoroquinolones. [12]

In present study Out of 192 prescriptions 44 drugs comes under oral route, 144 drugs comes under intravenous and 4 drugs comes under intramuscular. A similar study conducted by Raju KS et al shows that according to his study the

highest route of administration was parenteral route of administration. [2] In the present study Out of 192 prescriptions total 32 antibiotic drug interactions are found. In that 2 mild interactions and 30 moderate interactions are found. The common drug interaction is Ceftriaxone+Amikacin (78.1%) followed by Piperacillin+Amikacin (6.3%), Ampicillin+Amikacin (12.5%), Cefotaxime+Amikacin (3.1%). A similar study conducted by Malpani AK et al shows that Moderate drug interactions of 85% and minor interactions of 15% were found. [13]

CONCLUSION

According to the analyzed results and from view of literature, the conclusions made

- Maximum no of subjects comes under the age of 1-5 and minimum no of subjects comes under the age of 11-15. In that more no subjects are comes under male when compared to female.
- According to the study maximum no of subjects are admitted in the pediatric department is due to acute gastroenteritis.
- In present study various antibiotic prescriptions are found and that are comes under cephalosporins, aminoglycosides, penicillins, macrolides, tetracyclines, β -lactamase inhibitor and anti-tubercular agents
- In the study period antibiotics are the agent prescribed with greater frequency. Most commonly prescribed antibiotic in pediatric department is cephalosporins and least are β -lactamase inhibitors and anti-tubercular agents.
- The common route of administration is parenteral.
- The common drug interaction is Amikacin+ceftriaxone, that is moderate interaction.

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