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Due of Antibiotics in Pediatric LRTI Patients

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ABSTRACT
DUE is an ongoing, systematic process designed to maintain the appropriate and effective uses of drugs. DUE may be applied to a drug or therapeutic class, or diagnosis. DUE is typically classified into three different categories: prospective, concurrent and retrospective. Drugs prescribed for children are the same as those originally developed for adults. However, growth and development processes in children, in addition to disease profile, might expose them to different adverse effects. This study aimed at understanding drug utilization patterns in pediatric patients at a tertiary care hospital in Hyderabad. A prospective study was carried out on 106 pediatric patients diagnosed to have LRTI. It was found that the third generation Cephalosporins was the most commonly prescribed, ceftriaxone being the highest among all. This study focused on the analysis of prescriptions in the management of LRTI in pediatric patients.
Keywords: *Cephalosporins, DUE, LRTI, Pediatric patients.*

INTRODUCTION

Drug utilization research was defined by WHO in 1977 as the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences. A modern definition of pharmacoepidemiology is: "the study of the use and effects/side effects of drugs in large numbers of people with the purpose of supporting the rational and cost-effective use of drugs in the population thereby improving health outcomes"

Together, drug utilization research and pharmacy-epidemiology may provide insights into the following aspects of drug use and drug prescribing [1]

DUE is an ongoing, systematic process designed to maintain the appropriate and effective uses of drugs [2] DUE is typically classified into three different categories: prospective, concurrent and retrospective.

Prospective involves evaluating a patient's planned drug therapy before a medication is dispensed. Pharmacists routinely perform prospective reviews by assessing a prescription medication's dosage and its directions and reviewing patient information for possible drug interactions or duplicate therapy [3]. Concurrent is performed during the course of treatment and involves the ongoing monitoring of drug therapy to ensure positive outcomes.

A retrospective DUE is the simplest to perform since drug therapy is reviewed after the patient has received the medication [4]

DUE is a performance improvement method that focuses on evaluating and improving drug use processes to achieve optimal patient outcomes. DUE may be applied to a drug or therapeutic class, or diagnosis [5].

Markets for children's medicines tend to be small and the range of doses used may be wide for any drug formulation because many drugs prescribed widely for infants and children are not available in suitable dosage forms, leading to a lack of attention to pediatric medicines [6].

The present study aimed to evaluate the use of antibiotics in pediatric patients with LRTI and promote the rational medication use.

METHODOLOGY

A prospective observational study has been conducted in the pediatric department of tertiary care hospitals, Hyderabad. The study was carried out for a period of seven months. All pediatric patients who were diagnosed to have LRTI and required hospitalization for a minimum of 2 days were included in the study. Out-patients, patients with HIV positive status and whose care takers are not willing to give the consent were excluded. Structurally designed data collection form was used to record the patient's data such as demographics, lab investigations, treatment and progress.

RESULTS

Gender wise distribution of the patients

A total of 106 patients were enrolled during the study period among which 56 (52.8%) were males and the rest 50 (47.2%) were females.

Age wise distribution of patients

Out of 106 patients, about 46 (43.3%) were infants, 39(36.8%) were young child, 17(16.0%) were child and 4(3.7%) were adolescents.

Table 1: Age distribution of patients

Category	Age	Number of Patients	Percentage
Neonates	0-28 days	00	0
Infants	2-24 months	46	43.4%
Young child	2-6 years	39	36.8%
Child	6-12 years	17	16.0%
Adolescent	12-16 years	4	3.8%

Duration of hospital stay

Out of 106 patients, most of them stayed in the range of 2-4 days 53(50%) followed by 5-7 (43.4%) and others were summarized in the table as follows. Average stay per patient was 4.66 days

Table 2: Duration of hospital stay

Duration of hospital stays (days)	Number patients (%)
2-4	53(50)
5-7	46(43.4)
>8	7(6.79)

Number of drugs

Out of 106 patients, most of the patients were prescribed with 5-7 drugs (46.3%) followed by 8-10 drugs (29.2%) and others were summarized in the table as follows

Table 3: No of drugs

Number of drugs	Number of patients (%)
2-4	14(13.2)
5-7	49(46.3)
8-10	31(29.2)|
>11	12(11.3)

Number of Co-morbidities

Out of 106 patients, about 26 had comorbid conditions among which 6 were GI disorders and 2 had seizures. No multiple comorbidities were seen

Table 4: No of co-morbidities

Co-morbidities	24(22.6%)
No co-morbidities	82(77.4%)

Disease distribution
Out of 106 patients, 55 were diagnosed with non-specific LRTI, 33 had pneumonia and rest were summarised in the table

Table 5: Disease distribution

Disease Condition	Number of patients (%)
Pneumonia	33(31.1)
Bronchiolitis	15(14.2)
Bronchitis	3(2.8)
Non-specific LRTI	54(50.9)

Distribution of anti-microbial agent
Among all the enlisted population 3rd generation Cephalosporins were most widely prescribed

Table 6: Distribution of Antimicrobial Agents

AMA	ATC	NUM
PIPERACILLIN + TAZOBACTUM	J01CA12	9
AMPICILLIN	J01CR01	3
AMOXICILLIN+CLAVULANIC ACID	J01CR02	21
CEFTRIAXONE	J01DD04	51
CEFIXIME	J01DD08	9
CEFOTAXIME	J01DD01	20
CEFPODOXIME	J01DD13	12
AZITHROMYCIN	J01FA10	17
CLARITHROMYCIN	J01FA09	1
OFLOXACIN	J01MA01	2
CIPROFLOXACIN	J01MA02	1
AMIKACIN	J01GB06	25

DISCUSSION
Drug utilization is defined by the WHO as the "marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences [7]. Pharmacists participating in DUR programs can directly improve the quality of care for patients, individually and as populations, by striving to prevent the use of unnecessary or inappropriate drug therapy, prevent adverse drug reactions and improve overall drug effectiveness [8]

In our study a total of 106 patients were recruited out of which 56 (52.8%) were males and the rest 50 (47.2%) were females. About 46 (43.3%) were infants, 39(36.8%) were young child, 17(16.0%) were child and 4(3.7%) were adolescents and the detailed age wise classification of patients were shown in table 1.2. Among these patients 55 were diagnosed with non-specific LRTI, 33 had pneumonia and rest was summarized in the table above. These 106 patients were treated with wide variety of antibiotic classes such as penicillins, cephalosporins, macrolides, aminoglycosides, flouroquinolones. A total of 11 drugs from these different classes of drugs were used in the therapy for children. Third generation cephalosporins were the highly prescribed among all other medications ceftriaxone being the widely used next to amoxicillin.

CONCLUSION
The present DUE study focused on the analysis of prescriptions observed in the management of LRTI of pediatric patients of a tertiary care hospital. The study revealed ceftriaxone to be the drug being widely used. The study also focuses on the optimal use of antibiotics in the pediatric ward. Several strategies and guidelines have to be followed to promote the rational, optimal and safe use of drugs.

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