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RESEARCH ARTICLE

A Prospective Observational Study on Assessment and Evaluation of Cephalosporin in General Medicine Department at Tertiary Care Hospital

G. Sathyanarayanan*, P. Geetha, P. Shanmugasundaram
Department of Pharmacy Practice, School of Pharmaceutical Sciences, Vels University (VISTAS), Chennai, Tamil Nadu 600117
*Corresponding Author E-mail: **g.satya.pharm.d@gmail.com**

ABSTRACT:

BACKGROUND: The main of the study is to determine the Rational use of cephalosporins in general medicine. The key objectives to analyze the drug safety and utilization in prescription and to study the indications for which drug is prescribed.

Methods: A total of 150 patients enrolled in the study from general medicine department in tertiary care hospital. The documented data were evaluated for use of safety outcomes for the treatment associated with the use of cephalosporins. The data's were collected using specially designed data entry form and appropriateness is assessed with the help of NICE guidelines.

Results: Cephalosporins are empirically prescribed in the general medicine department. Male patients accounted for (61.3%) and female patients were (38.6%). Majority of study population diagnosed with Urinary tract infection 21.33% (UTI) followed by other disorders like Lower respiratory tract infections 18.66% (LRTI), Upper respiratory tract infections11.33% (URTI) as primary disease. 32% of co morbidity conditions were seen . Majority of cephalosporins were prescribed in injection form (64.6%) and oral form (35.33%). A total of 7 ADR and it has been identified. Among the classification of cephalosporins mostly, Third generation cephalosporins were mostly prescribed (80.65%).

Conclusion: Study concludes that out 150 patients ,most patients hospitalized with Urinary tract infection and followed by other disease conditions. Mostly third generations cephalosporins were used to treat in various conditions in general medicine ward. Mostly IV route was prescribed based on the conditions. It shows that the cephalosporins are appropriately prescribed according to the guidelines.

KEYWORDS: Cephalosporins , Appropriateness, Drug Utilization Evaluation, Adverse Drug reactions.

INTRODUCTION:

Drug utilization evaluation(DUE) is an ongoing, authorized and systemic quality improvement process, which is designed to: review drug use and/or prescribing patterns, provide feedback of results to clinicians and other relevant groups, develop criteria and standards which describes optimal drug use, promote appropriate drug use through education and other interventions.

Rational use of drugs is essential since drugs are expensive and they constitute a large percentage of health care costs. Rational use of drugs is defined by the World Health organization as " Patient receive medicines appropriate to their clinical needs, in doses that meet their own requirements for an adequate period of time and at the lowest cost to them and their community" (World Health organization ; IOCU 1998).

Cephalosporins are bactericidal (inhibit the bacterial cell wall synthesis) in actions. Cephalosporin is commonly used class of anti-bacterial. They are preferred over other classes of antibiotics due to, lower hypersensitivity reactions, broad spectrum of action, cheaper cost and better outcomes. Third generation Cephalosporins are

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the most commonly prescribed empiric broad spectrum antibiotic, having given its advantages, preserving the sensitivity of Cephalosporin is important. Though; cephalosporin use often provides lifesaving therapy to those who have a serious bacterial infection, resistance to antimicrobials is a global problem and some of the significant global threats are multi-drug resistant Tuberculosis and drug-resistant Malaria.

Lexley M Pinto Pereira et al conducted study on use of cephalosporins in a tertiary hospital. They concluded that the by recommend hospital laboratories undertake continuous surveillance of antibiotic resistance patterns so that appropriate changes in prescribing guidelines can be developed and implemented. Though guidelines for rational antibiotic use were developed they have not been re-visited or encouraged, suggesting urgent antibiotic review of the hospital formulary and instituting an infection control team.

The main of the study is to determine the rational use of cephalosporins in general medicine. The key objectives to analyze the drug safety and utilization in prescription and to study the indications for which drug is prescribed.

MATERIALS AND METHODS:

A prospective observational study of 4 months section was carried out. The study site was conducted in the general medicine department of hospital. The study proposal was approved by Ethical committee clearance was obtained on 22/6/2010(Ref: IEC/DOPV/2015/29).
Sample size: A total 150 prescription were collected.
Inclusion criteria:

- Patient who are all above 18 years of age (both sex).
- Patients who all prescribed with cephalosporins.

Exclusion criteria:

A. Patients who are below 18 years.
B. Patients who are not prescribed with cephalosporins.
C. Pregnant women.

During data collection patients were informed about the study using patient information format. A regular ward round into study department was carried out. The medical charts of patients were screened for appropriateness in all possible ways.

DATA ANALYSIS:

The study data of the patient were screened for appropriateness. Assessment is carried out by antimicrobial guide lines and Nice guidelines.

1. Nice guidelines for Urinary tract infection, LRTI, URTI, Pelvic inflammatory disease values obtained were averaged for analysis. The collected study data of patients were analyzed by MS office excel version 2007 for using mean and percentage analysis.

RESULTS:

A total number 150 patients included in the study, based on exclusion and inclusion criteria.

Table 1: **Age distribution of patients (n=150)**

Age group	No of patients(n=150)	Percentage %
18-25	27	18.00
35-50	41	27.3
50-65	49	32.6
65-80	33	22.00

In my study population male populations were higher than compared to females. (Table 2)

Table 2: Gender distribution of patients (n=150)

Gender	NO. patients	Percentage %
Male	98	61.3
Female	52	34.6

Among study population the most common diagnosis was found to be Urinary tract infection and followed by LRTI, URTI and others (Table3).

Table 3: **Diagnosis of Study population (n=150)**

Diagnosis	No. of patients	Percentage%
URTI	17	11.3
UTI	32	21.3
LRTI	28	18.6
GI	20	13.3
Fever	24	16
Pelvic Inflammatory disease	6	4
Sepsis	7	4.6

URTI (upper respiratory tract infection), LRTI (lower respiratory tract infection), GI (gastro intestinal) and UTI (urinary tract infections)

Type of treatment during hospital stay:

In my study 84.6% of patients received empirical therapy and 15.3% of patients received specific treatment.

Co morbid conditions:

The co morbid conditions seen in study population was (36%). Common co morbid condition were seen more is Hypertension (14.6%). 64% of study population not shown co morbidities.
(table4)

Table 4: Co morbid conditions of study population (n=150)

Co morbidities	No. of patients	Percentage %
Diabetes	18	12
Hypertension	22	14.6
Asthma	9	6.00
Others	5	3.3
No Co morbidities	96	64.0

No. of cephalosporins prescribed during hospital stay:

One cephalosporins prescribed in 92.66% of population and 7.33% received two cephalosporins during their hospital stay.

Table 5: No. of cephalosporins prescribed during their hospital stay (n=150)

No. of cephalosporins	Percentage
One	92.6
Two	07.3

Route of administration:
Cephalosporins mostly prescribed in the injection form (64.6%) than oral (35.3%) form .This is based on patients conditions .IntraVenous route of administration is received in 55% of patients, followed by oral administration (35.3%). (Table 5)

Table 6 : Route of administration (n=150)

Route of administration	No. of patients	Percentage %
IV (intravenous)	82	54.6
IM Iintramuscular)	15	10
PO (Oral)	53	35.3

Individual drug therapy
Most widely prescribed cephalosporins in study populations was found to Cefotaxime (49.33%)

Table7: Individual drug therapy (n=150)

Drug therapy	No. of patients	Percentage %
Cefotaxime	74	49.3
Cefuroxime	28	18.66
Ceftriaxone	34	22.66
Cefodoxime	02	1.33
cefatazidime	11	7.3
cefepime	01	0.66

Comparison of cephalosporins used during the hospital stay:
Mostly third generations (80.7%) are prescribed more and followed by second generations (18.6%).

Table 8: Comparison of cephalosporins (n=150)

Generations	Percentage
First	-
Second	18.66
Third	22.66
Fourth	1.33

Therapeutic class of medication during hospital stay
The details of therapeutic drugs given in table 9.

Table 8: Therapeutic class of drugs used along with cephalosporins (n=150)

Therapeutic class	Percentage%
Antimicrobials	76
Gastrointestinal	99.3
Analgesics	48.6
Respiratory	6
Oral diabetic	29.3
Anti-hypertensive	14.6
Vitamins and supplements	62.3

Mostly gastrointestinal drugs, antimicrobials are prescribed along with the cephalosporins.

Gastrointestinal drugs are mostly not used for gastric acid disorders but it is used as prophylactic treatment for potential gastric disturbances due to cephalosporins and other antimicrobials.

Type of ADR:
All the reported ADR was found to type B in nature.

Antibiotics co prescribed in study population
The mostly antibiotics prescribed along with cephalosporins were ciprofloxacin (37.33%) followed by metronidazole (28.66%)

Table 9: Antibiotics co prescribed (n=150)

Antibiotics co prescribed	Percentage%
Metronidazole	28.6
Albendazole	9.3
Gentamicin	10.6
Ciprofloxacin	37.3

DISCUSSION

Study provides data and the usage of cephalosporins in patients admitted in general medicine department. Cephalosporins prescribed patients are identified in the general medicine ward are included in the study.

Patients who are not below 18 years and pregnant ladies are excluded from my study.

PATIENT CHARACTERSTICS:
Male population (32.66%) was found more than female (27.33%). The similar to study conducted by Shankar et.al that showed a male predominance (61.6%) compared to females (38.8%).

In my study cephalosporins are mostly prescribed in the age group 50 to 65 (32.66%), followed by 35-50 (27.33%). The average of males is 36.6% and females is 23.3%

Average length of hospital stay of my study population hospital stay is 10 days due to the condition and co morbidity of the disease. This was similar to the study conducted in a teaching hospital in Nepal where median length of hospital stay was 9 days.

In our study 32% of co morbidity was seen in study population. The common conditions are DM, Asthma, HTN and others.

Multiple drug usage in my study is due to increased no. of Co morbidities. 32% of study population present with at least on co morbidity condition.

Mostly in the medicine ward the patients were admitted due to following of diagnosis URTI (upper respiratory tract) (11.33%). Gastro intestinal drugs (13.33%), UTI (Urinary tract infections) (21.33%) LRTI (Lower respiratory tract infection) (18.66%), Skin infection (8.5%), Fever (16). Most common diagnosis seen is UTI.

Among the drugs received by patients, Anti-infective were mostly prescribed and drugs for GIT, HTN and oral hypoglycemic agents was prescribed according to co morbidity condition.

Increased use of antimicrobials could be due to their increased use in empirical treatment of infections. Greater utility of drugs for acid related disorders is not only due to their use in the treatment of gastric disorders, but also due to their use as a prophylactic treatment for potential gastrointestinal disturbance owing to medication use of Cephalosporins.

Anti-infective agents was found to be (70%), analgesics was found to be (48.66), oral diabetic drugs was found to be (12%) and vitamins (62.66) . This finding is similar to study conducted by Karin et al where in anti infective for systemic use, drugs for alimentary tract and metabolism and central nervous system drugs.

Majority of patients is prescribed with one formulation (92.66%) where two formulation cephalosporins are 7.33% in medicine ward respectively.

Majority of cephalosporins were prescribed in the IV route (42%) and followed by oral route (35.3%).

Third generation cephalosporins are mostly prescribed Cefotaxime (49.33%) and Ceftrioxme (22.66%) and followed by cefuroxime (22.6%). The similar study conducted by Jonathan and et.al showed a higher use of third generation of cephalosporins.

This is due to the low incidence of ADR and good penetration to the body tissues and wide coverage to all bacteria.

It was found that majority of the reported ADRs were found to be probable and type B in nature. Majority of reported reactions were moderate in their severity.

Gastrointestinal system and skin were the organ system affected by ADR and of which GI effects were found to be higher. ADRs commonly seen in the study patients were diarrhea, vomiting and headache.

CONCLUSION:

Cephalosporins especially third generation were widely used in medicine departments to treat various disease conditions. Urinary tract Infections is the major disease condition followed by Respiratory Tract Infections and Digestive system infections were seen in the admitted patients.

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