



A STUDY ON DRUG UTILIZATION REVIEW OF CEPHALOSPORINS IN GENERAL MEDICINE DEPARTMENT OF A TERTIARY CARE TEACHING HOSPITAL


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ABSTRACT

Drug Utilization Review is an authorised, structured, ongoing review of prescribing, dispensing and usage of medication before, current and after the therapy. Cephalosporins are among the most commonly used class of antibiotics in hospitals and healthcare facilities world-wide and the use of newer generation of cephalosporins have increased in the developed countries with limited number of studies investigating the drug prescribing and utilization pattern in the hospital setting. Hence the present study was carried out aiming to systematically evaluate and review the prescribing patterns of various cephalosporins in general medicine department in a tertiary care teaching hospital at Gujarat. A prospective observational drug utilization study was carried out for a period of 6 months. A total of 110 patients enrolled in the study from general medicine department in tertiary care hospital. The data were evaluated for use of cephalosporins with their safety outcomes. The data's were collected using specially designed patient data collection form and the appropriateness is assessed with the help of NICE guidelines. Cephalosporins are empirically prescribed in the general medicine department. Male patients accounted for (59%) and female patients were (41%). Majority of study population prescribed with third generation 94% followed by second generation 3% as primary treatment. Majority of cephalosporins were prescribed in injection form (89.83%). The present study concludes that out of 110 patients, most patients hospitalized with infection and followed by other disease conditions. Mostly third generations cephalosporins were used to treat in various conditions in general medicine ward. Mostly parenteral route was prescribed based on the conditions. It shows that the cephalosporins are appropriately prescribed according to the guidelines.

Key Words:-Drug Utilization Review, Patient Care, Cephalosporins, Antibiotics.

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According to the World Health Organization (WHO), Drug Utilization Review (DUR) is “an authorized, structured, ongoing review of prescribing, dispensing and use of medication”. DUR encompasses a drug review against predetermined criteria that results in changes to drug therapy when these criteria are not met. It involves a comprehensive review of patient's prescription and medication data before, during and after dispensing to ensure appropriate medication decision-making and positive patient outcomes (Anonymous 1). DUR programs provide corrective action, prescriber feedback and further evaluations. It is an ongoing, systematic process designed to maintain the appropriate and effective use of medications. 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

INTRODUCTION

or inappropriate drug therapy, prevent adverse drug reactions and improve overall drug effectiveness (Strom B, Kimmel S, 2012; Tripathi K, 2013).

Cephalosporins are a group of semi-synthetic antibiotics and they are derived from ‘cephalosporin-C’ which is obtained from a fungus *Cephalosporium* and also derived from the mold known as *acremonium*. Cephalosporins are chemically related to penicillin’s; their nucleus consists of a β -lactam ring fused with a dihydrothiazine ring, (7-aminocephalosporanic acid), by adding different side chains at position 7 of β -lactam ring structure (altering spectrum of activity) and at position 3 of dihydrothiazine ring (affecting pharmacokinetics), a large number of semi-synthetic compounds are produced. These compounds have been divided into 4 generations and this division has a chronological sequence of development, but more specifically, takes into consideration the overall antibacterial spectrum as well as its potency. All the cephalosporins are bactericidal in nature and have the mechanism of action of inhibition of bacterial cell wall synthesis; also they bind to different proteins. This helps to explain differences in lack of cross resistance, potency and spectrum (Goudanavar P et al., 2016; Nagaraju K et al., 2014; Chitra B et al., 2016).

METHODOLOGY

A prospective observational study of 6 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 30/08/2018 (Ref: PUIECHR/PIMSR/00/081734/1804).

Sample size: A total 110 prescription were collected.

Inclusion criteria

- Patient who are all above 18 years of age (both Gender)
- 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 assessed by antimicrobial guide lines and nice guidelines. The collected data of patients were analyzed by MS office excel version 2007 for using mean and percentage analysis.

RESULTS

Total number of 110 patients were included in the study, based on exclusion and inclusion criteria.

In our study male population male population were higher than compare to females. (Fig 2).

Among study population, the most commonly prescribed cephalosporins was found to be ceftriaxone and followed by cefotaxime, cefixime and others.

Third generation cephalosporins (96%) were widely prescribed as compared to second generation cephalosporins (4%) respectively.

Around 95% of Broad Spectrum of Cephalosporins and 5% of Narrow Spectrum of Cephalosporins were prescribed.

In majority of patients, Cephalosporins were administered intravenous (IV).

The details of cephalosporins prescribed represents maximum of 4-6 days of stay with 30 patients prescribed with Cephalosporins and minimum of 10-12 days of stay with 1 patient.

Fig 1. Age distribution of patients (n=110)

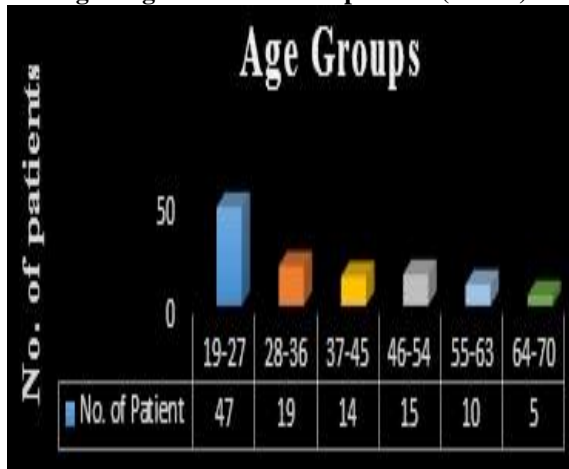


Fig 2. Gender distribution of patients (n=110)

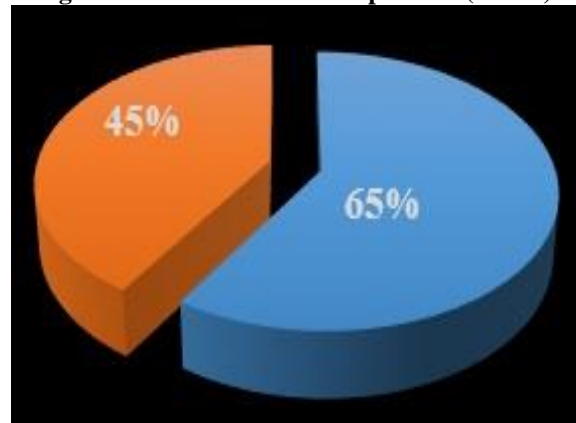


Fig 3. Commonly prescribed cephalosporins (n=110)

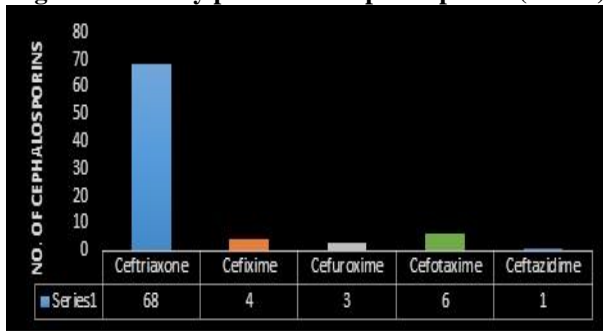


Fig 4. Comparison of cephalosporins (n=110)

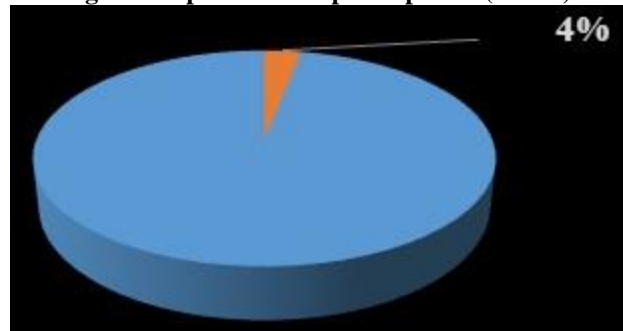


Fig 5. Spectrum analysis of antibiotics (n=110)

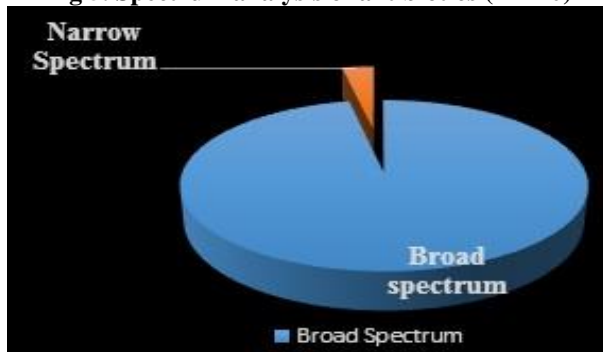


Fig 6. Route of administration (n=110)

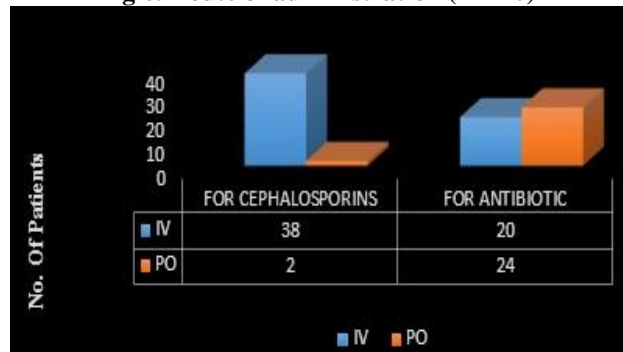


Fig 7. Length of stay (n=110)



DISCUSSION

Our study was conducted to review the appropriate and rational usage of Cephalosporins along with other AB and the cost effectiveness of the prescribed drugs to minimize the economic burden to the patients as well as the society. The study was done for 110 in-patients in Medicine department with various parameters such as Age, Gender, dosage regimen, name and generations of prescribed drugs, duration of therapy and cost analysis.

The study reveals the wider use of Cephalosporins especially 3rd generation which are Broad Spectrum AB and from that the most frequently prescribed was Ceftriaxone and combinational therapy was Cefoperazone + Salbactam. The widely used formulation of Cephalosporins is Parenteral while of other AB is Oral. The frequency of Cephalosporins was found to be BD while of other AB was TDS. For various

indications observed Cephalosporins was commonly prescribed to treat Fever followed by SCD while AB were prescribed to treat AGE. The duration of the therapy for the patients prescribed with Cephalosporins and other AB was found to be 4-6 days. The most widely prescribed AB was Metronidazole and Azithromycin. Physicians or practitioner should be more specific in their diagnosis and prescribing the medication therapy to the patients along with the financial burden to the consumers and patients. To review and evaluate the use and cost of Cephalosporins and other AB at the hospital to assist clinicians in optimizing clinical care of patients was needed. The cost wise analysis and the cumulative cost for Cephalosporins and other AB for the entire therapy were calculated to analyse the maximum and minimum prescribed price and the % price variation of the patients. The treatment regimens implemented and analysed in most of the cases was without doing any culture

sensitivity tests which leads to irrational prescribing and inappropriate usage of drugs.

The objective of the study was to observe the potential utility of the data in designing strategies both at the level of the administrators for rational prescribing and review of drugs and policy decisions respectively and to reduce the socio-economic burden.

CONCLUSION

The present study revealed the wider usage of Cephalosporins especially third-generation which are Broad Spectrum AB in Medicine department. Most widely used formulation of Cephalosporins was parenteral. The treatment regimens implemented and analysed in most of the cases were without doing any culture sensitivity tests which leads to irrational prescribing and inappropriate usage of drugs. Physicians should be more specific in their diagnosis and prescribing

the medication therapy to the patients along with the financial burden to the individuals and the society as well. An antibiotic monitoring team comprising a pharmacist, physician, medical microbiologist and infection control nurse to periodically review and evaluate the use and cost of antibiotics at this hospital to assist clinicians in optimizing clinical care of patients were needed. The broader outcome of this study would be the potential utility of this data in designing strategies both at the level of the administrators for rational prescribing and policy decisions respectively and to reduce the economic burden to patients.

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Nil

CONFLICT OF INTEREST

Nil

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