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Original Research Article

Drug Utilization Evaluation of Analgesics and Antibiotics in inpatient Department of Orthopedics at Hyderabad

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Abstract

Aim: This is a retrospective study which was carried out for a period of six months in orthopedic inpatient department at Aster prime hospital, Hyderabad. ***Objective:*** The objectives of the study are to decrease the irrational use of drugs to the patients, decrease unnecessary drugs, usage of proper dosage and administration of the drugs and prevent adverse drug reactions in order to improve the quality of life of patients. ***Methodology:*** A total of 104 prescriptions of the patient treated with analgesics and antibiotics for post-operative pain management were collected and analyzed in the inpatient orthopedic department. The prescriptions were analyzed and categorized into varieties based on antibiotics and analgesics prescribed, demographic parameters, comorbid conditions, type of orthopedic diseases diagnosed, polypharmacy etc. ***Conclusion:*** The study presented the prescription trends of antibiotics and analgesics in orthopaedic department. This kind of study will help as a guideline to use drugs for policymaking decision in the health care system. Prescribing medicines by generic names would help in less expensive treatment. Polypharmacy and combination of drugs has to be discouraged to minimize adverse drug reactions and drug interactions.

Keywords: Drug utilization evaluation, analgesics, antibiotics, orthopedics, prescribing pattern, polypharmacy.

INTRODUCTION

Drug utilization evaluation (DUE) is an authorized, structured, enduring review of prescription, dispensing and use of medicine. Drug utilization evaluations involve a comprehensive review of patient's prescription and medication data before, during and after dispensing to ensure appropriate medication decision and positive patient outcome [1]. DUE is done to ensure the rational use of drugs. It helps to know the number of patients that are exposed to a drug in a specific period, their extent of use whether if they are overused or underused. It also determines the pattern of used drugs and extent of alternatives used for curing the clinical conditions [2]. Drug utilization evaluation helps to enable modifications in prescription and to increase therapeutic benefit and decrease adverse effects. The goal of DUE is to ensure optimal therapy and also ensure that the drug therapy meets the standards of guidelines [3]. It also helps in creating guidelines for optimal care, evaluate effectiveness of medication therapy, enhancement of accountability or responsibility in the medicine use process, preventing medication cost, preventing medication related problems like adverse events, treatment failures; enhancing education of areas where needed by the health care providers [4].

Since, Analgesics are the most commonly prescribed drugs in the orthopedics department, for long periods, it is known that injudicious use of these drugs lead to morbidity and mortality due to severe ADRS [5]. Rational use of these drugs is required and aims at evaluating the accessibility, availability and correct prescribing of the medications ensuring low cost and no side effects to the patient. DUE studies mainly imply on provision of better patient care that can be achieved if done appropriately. DUE studies are designed to evaluate and improve the prescribing and administration and the rational use of medications [6].

Analgesics help in reduction of pain and inflammation acting in the central nervous system or on the peripheral pain receptors without affecting the conscious of a patient. Since, no single agent is ideal the physician chooses the best suitable drug. However, prolonged use of analgesics may cause resistance or serious adverse effects such as GI complications, treatment failure etc. therefore, it is extremely important

for a drug utilization evaluation study with antibiotics and analgesics to check their efficacy in patients [7].

MATERIALS AND METHODS

This retrospective study was carried out in the orthopedic inpatient department in Aster Prime Hospital, Hyderabad. The study was conducted on a total of 104 prescriptions. The study period was six months.

Inclusion Criteria

The data for the study was collected from the patient's case sheets and treatment charts. The data was recorded in a patient data collection form. Patient receiving analgesics and antibiotics in orthopedic inpatient department during study period were included irrespective of age, gender, diagnosis and treatment.

Exclusion Criteria

Lactating and pregnant women were excluded. Patients who are not willing to participate in the study were also excluded.

Collection of Data

Inpatient prescriptions were assessed and observed. Patient demographic details, complaints, co morbidities, laboratory investigations, mode of treatment (IV or oral), and therapeutic management were recorded. Number of analgesics giver per prescription, combination antibiotic used were observed and recorded. Adverse drug effects were recorded if occurred.

Statistical Analysis

Data were analyzed using descriptive statistics and the results were presented by using frequency distribution table with Microsoft Excel.

RESULTS

In the inpatient department of Aster Prime Hospitals, we collected 104 prescriptions and were analyzed for the following results.

Gender-Wise Distribution

A total number of 104 prescriptions were analyzed, the male patients were found to be 46 and female patients were found to be 58. Female were more prone to orthopedic disease when compared to male patients. The details were shown in the below Table-1.

Table-1: Gender-wise Distribution

S.No	Gender	Number of Patients
1.	Male	45
2.	Female	59
3.	Total	104

Age-wise Distribution

The patients were also classified based on their age groups or the age at which they were diseased. The age group of 51-60 years are more prone for orthopedic diseases. Followed by 61-70 years (n=32) and 71-80 years (n=24). The age groups of 21-30 years were found with n=14, 31-40 years n=6, 41-50 years n=6, 51-60 years, n=18 and those of above 80 years n=4. The age group of 51-60 years are more prone for orthopedic diseases. The detail of age-wise distribution is represented in below Figure-1.

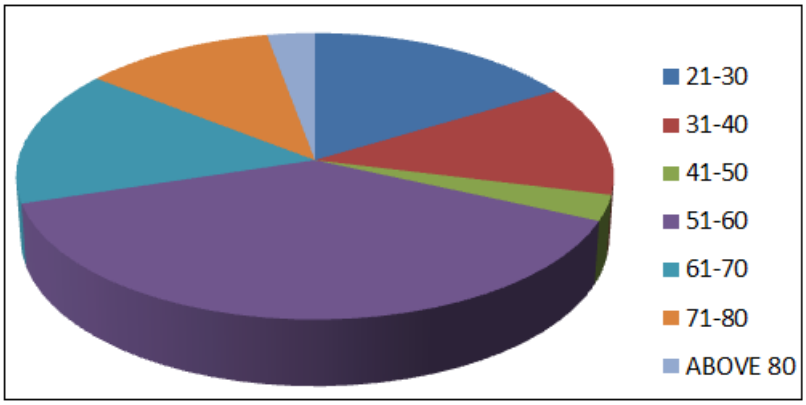

Fig-1: Age-wise Distribution

Co morbid Conditions

Out of 104 patients, some patients also had other co morbidities such as Hypertension, Diabetes mellitus, Thyroid disorders and other conditions. The detail of the co morbidities was represented in the Figure-2.

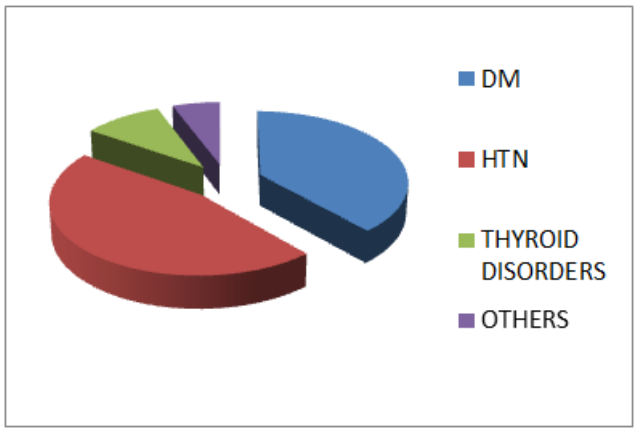

Fig-2: Co morbid Condition of Patients

Types of Orthopedic Diseases Diagnosed

104 patients were classified based on the diagnosis of their diseases. Fracture was seen in 20 patients, osteoarthritis n=35, osteoporosis n=13, road traffic accident n=7, spondylitis n=6, rheumatoid arthritis n=8 and post-operative n=15. Osteoarthritis is more commonly seen in the patients. The data of diagnosed patients are represented in the below Figure-3.

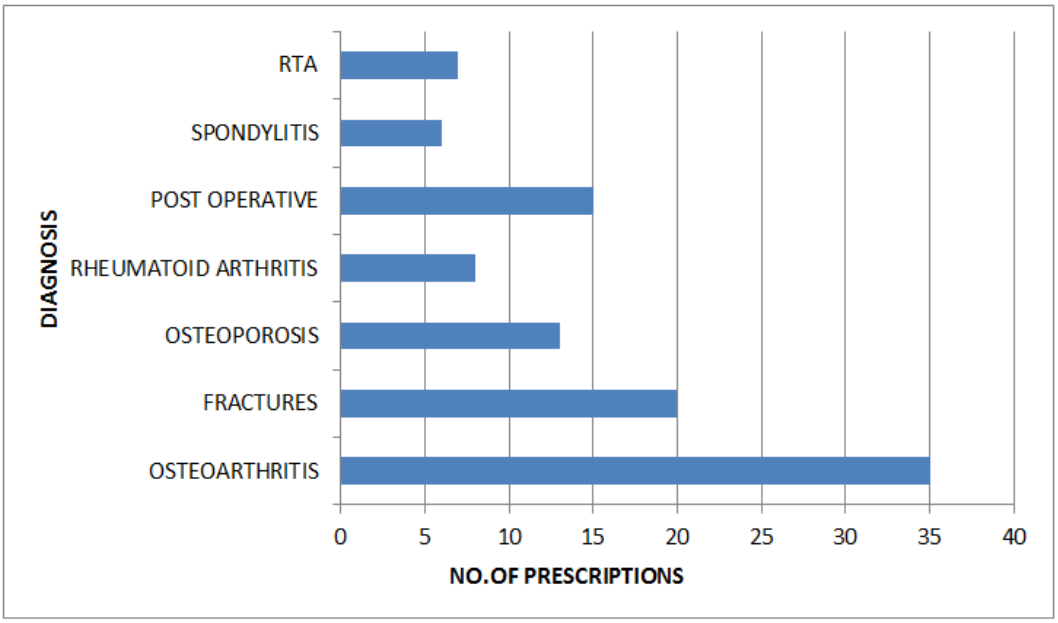

Fig-3: Types of Orthopedic Diseases Diagnosed

Number of Analgesics Prescribed

Out of the 104 patients in the inpatient department of orthopedics, the greatest number of patients were prescribed with aceclofenac n=50, followed by tramadol n=28, diclofenac n=14 and paracetamol n=12. The data of the analgesics drugs prescribed is represented in the below Figure-4.

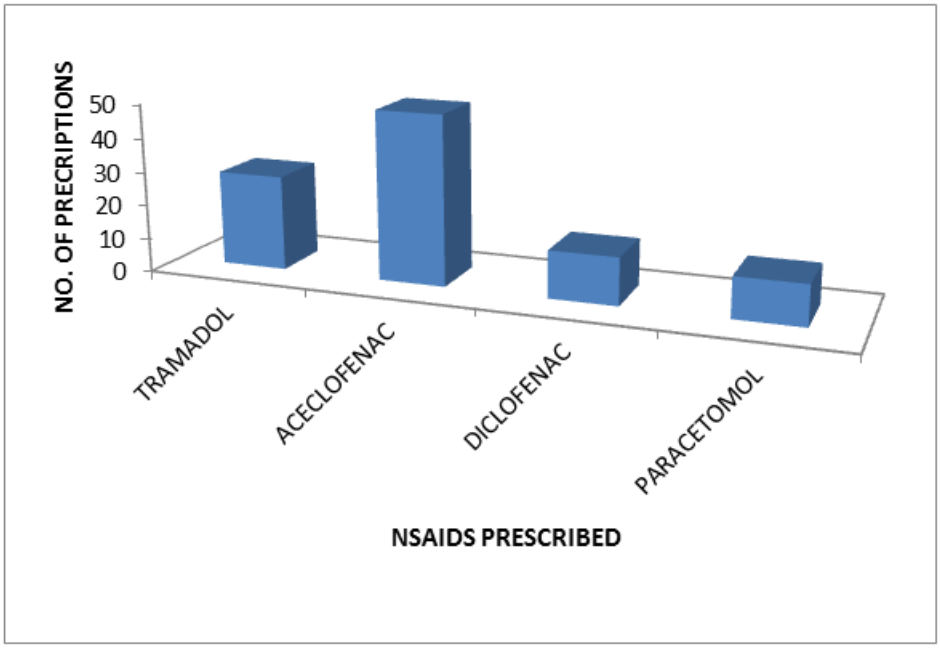

Fig-4: Analgesics Prescribed to the Patients

Analgesics Prescribed Per Prescription

Out of the 104 patients, the number of drugs prescribed per prescription was found one in 34 patients, two in 60 patients and three in 10 patients. Majority of the prescriptions contained of at least two drugs. Table-represents the data obtained.

Table-5: Analgesics Prescribed Per prescription

S.No	Analgesics	Number of prescription
1	One	34
2	Two	60
3	Three	10
4	Total	104

Antibiotics Prescribed to the Patients

Out of the 104 patients, most of them were prescribed with ceftriaxone n=50, followed by ciprofloxacin found in n=22 patients, ofloxacin n=12 patients, cefoperazone n=10 and ampicillin in n= 10 patients. The data of antibiotics prescribed was shown in the below Figure-6.

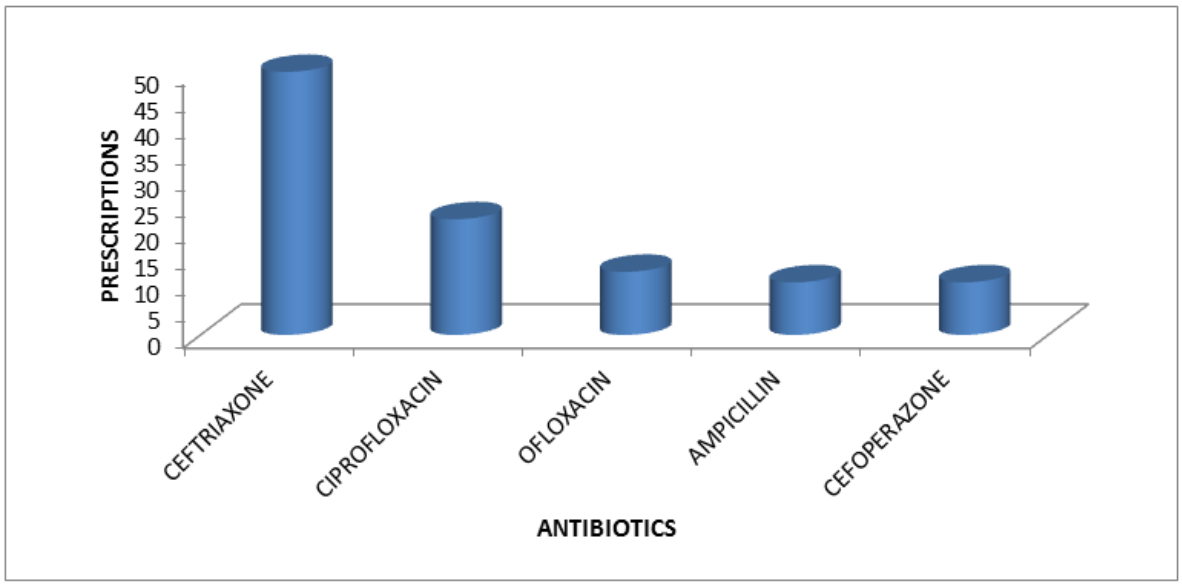

Fig-6: Antibiotics Prescribed to the Patients

Number of Antibiotics Prescribed Per Prescriptions

Out of 104 patients, the number of prescriptions containing one antibiotic was found to be n=34, two was found to be n=60 and three was n=10. The data obtained was shown in the Table-3.

Table-3: Antibiotics Prescribed Per Prescription

S.No.	Antibiotics Per Prescription	Number of Prescription
1	One	34
2	Two	60
3	Three	10
4	Total	104

Distribution of Patients According to Indications Assessed

The total number of drugs used in inpatient was found to be 556. The following Table-4 shows the distribution of patients according to indications assessed.

Table-4: Distribution of patients according to indications assessed

Variable	Number
Average number of analgesics per prescription	1.7
Average number of antibiotics per prescription	1.1
Percentage of analgesics and antibiotics prescribed by generic name	0%
Percentage of analgesics and antibiotics prescribed by brand name	100%

Polypharmacy

Nearly 72 prescriptions were found to have more than 5 drugs and 32 prescriptions were found to have 2-4 drugs which were shown in below Table-5.

Table-5: Polypharmacy of prescriptions

S.No	Number of drugs	Number of prescriptions
1.	2-4	32
2.	More than 5	72
	Total	104

DISCUSSION

A total of 104 prescriptions were analyzed in inpatient orthopedic department at Aster Prime Hospital, Hyderabad. The demographic parameters of the patients reveal that the number of male patients were 45% and the number of female patients were 55%. The patients of age group between 51-60 years (30%) were maximum and more prone to the orthopedic disease. This finding is similar to the studies done in different parts of India. Diabetes and Hypertension were the two most common co morbid conditions [8]. Osteoarthritis was found to be 26% and was the most commonly diagnosed disease among the patients.

Antibiotic resistance is increasing day by day and for management of infectious diseases antibiotic resistance has poised a significant threat. Moreover, AMAs are most frequently prescribed drugs increasing multidrug resistance with limited availability of newer stringent infection control as well as rational antibiotic prescription [9, 10]. In our study we found that ceftriaxone was prescribed in 48% of the total patients in the inpatient department. This may be due to the easy availability of the drug. This was followed by ciprofloxacin 21% in total number of patients. The number of antibiotics prescribed per prescription in the inpatient department on a maximum was found to be two antibiotics per prescription by 58% of the total patients.

The most prescribed class of analgesics given in the patients for inpatient department was found to be analgesics. In the inpatient department, aceclofenac (48%) was the most prescribed followed by tramadol (26%) despite of GI complications being a major ADR. The incidence of post-operative complications reduces with appropriate pain control. Being a nonselective COX inhibitor it is found to have more effect in reducing inflammation caused by mild to severe pain. The advantage of this is that post-operative pain can be treated by administering through parenteral route in the initial post-operative period which can be later changed to oral route. Several studies have shown that non opioid drugs show lesser side effects than opioid drugs [11].

The maximum number of drugs per prescription were found to be more than 5 (69%) in ip department which shows the practice of polypharmacy. Multiple drug prescribing results in polypharmacy which may cause irrational prescribing and may induce severe ADRS. In all the prescription 100% of drugs were prescribed on brand name which puts the cost burden on the patients. Most prescriptions contained other drugs of which antacids were found the most prescribed.

CONCLUSION

This study was conducted in the orthopedic department of Aster Prime Hospitals, Hyderabad, Telangana, India. It was conducted to observe and analyze the prescribing pattern of analgesics at orthopedic inpatient department. The study reveals that's the patients were given antibiotics, analgesics, antacids etc. The rational prescribing of antibiotics need to be ensured in order to decrease the risk of antibiotic resistance. Prescription of broad spectrum antibiotics without evidence by cultural sensitivity tests must be avoided. There is a need to follow ethical guidelines to ensure rational utilization of drugs also the number of drugs per prescription should be reduced by prescribing only appropriate drugs. Drug utilization studies are effective tools to evaluate the prescribing trends, efficiency and cost effectiveness. These are necessary in every health care setting. Drug policies, standard guidelines, committees and intervention strategies should be introduced and promoted to decrease the prevalence of orthopedic diseases and to promote rational and appropriate use of the drugs used in the orthopedic department. Along with this patient compliance and medication adherence is essential for decreasing the burden of orthopedic diseases.

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