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A Study on Prescription Pattern of Drugs in Orthopedics Inpatient Department of Navodaya Medical College Hospital and Research Centre in Raichur

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ABSTRACT

Background: Periodic evaluation of drug utilization pattern is necessary to promote rationaldrug use by. In orthopaedics practice, the prescribing pattern needs to be regularly monitoredsince many of the drugs prescribed carry untoward adverse effects. In this backdrop, the present study was conducted to explore the prescribing pattern in orthopaedics outpatient department (OPD) of Navodaya medical college hospital and research centre in Raichur.

Methods: This is a prospective observational study conducted for 3 months, in Navodaya medical college hospital and research centre in Raichur, a 1000 bedded tertiary care rural based, teaching hospital. Total 100 patients were included in this study.

Results: Total 1216 drugs were prescribed in 100 prescriptions. Average number of drugs per prescription was

7.34. Average duration of prescription was 9 days. Percentage of drugs prescribed by genericname was 29.7%. Percentage of encounter with an Antibiotic prescribed was 60.23% i.e. outof 100 prescriptions antibiotics were prescribed in 60. Percentage of encounter with an Injection prescribed was 60% which means out of 100 prescriptions, injectables were prescribed in 60. Percentage of drugs prescribed from National Essential Medicine List was 52.63%. Percentage of drugs prescribed from WHO model List was 32.46%. Diclofenac (14.25%) was most commonly prescribed drug. Incidence of polypharmacy was quite high incontext of Analgesics. Almost 19% of prescriptions had 3 drugs. Orally prescribed Analgesicswere 62.4%, Injectables 34% and Topical 3.6%.

Conclusion: The study provides an insight into the prescribing pattern in orthopaedics in-patients. It highlights the importance ofemphasizing rational drug prescribing and toward improving awareness of the physicians andmedical students to the WHO recommended standards on prescribing indicators.

Keywords: Orthopedics, Prescribing patter, National Essential Medicine List**,** WHO Model List**,** Analgesics**,** Rational drug use

INTRODUCTION

Drug utilization has been defined as the marketing, distribution, prescription, and use ofdrugs in a society with special emphasis on the resultant medical and socialconsequences.[1] In developing countries like India, where the financial resources arescarce and the affordability of the patients is less, implementation of the rational use ofmedicines becomes important. [2]. The principal aim of drug utilization research is tofacilitate the rational use of drugs in populations. For individual patient, the rational use ofa drug implies the prescription of a well-documented drug at an optimal dose, together with the correct information, at an affordable price. Without knowledge of how drugs are beingprescribed and used, it is difficult to initiate a discussion on rational drug use or to suggestmeasures to improve prescribing habits. Information on the past performance of prescribersis the linchpin of any auditing system. Drug utilization research in itself does notnecessarily provide answers, but it contributes to rational drug use in important ways. Drugutilization research can increase our understanding of how drugs are being used as follows.[3]

- It can describe the extent of use at a certain moment and/or in a certain area (e.g. in a country,region, community or hospital). In order for such descriptions to be meaningful, they shouldform part of a continuous evaluation system, which allows for the tracking of patterns over time and the identification of trends in drug use.
- On the basis of epidemiological data on a disease, researchers can estimate the extent to whichdrugs are properly used, overused, or underused.
- A drug use profile and alternative drugs used to treat particular conditions can be determinedthrough this method.
- Comparisons can be made between observed patterns of drug use for a specific disease and current recommendations.[4]

In General, in orthopedics departments studies are carried mainly on surgical procedures. Very rarely any study of drug distributions type are planned. Because of communication gap between nonclinical pharmacologists and clinical surgical orthopedics consultants whoare mostly interested in surgery and have less time also for drug discussions on rational therapy very rarely such studies are conducted. Drug utilization studies do help in findinga new way to implement the rational drug therapy and areas of improvement in terms of better, effective, economic treatment with lesser adverse effects, lesser suffering to patient (1kaur). So WHO promotes Rational drug therapy.[5] The prescribing pattern in orthopedics needs to be regularly monitored since most of the drugs prescribed carry untoward adverse effects. Earlier research conducted with similar objectives has revealed that drugs commonlyprescribed in orthopaedics department were nonsteroidal anti-inflammatory drugs (NSAIDs),antibiotics, and ulcer protectives.[6]

The discipline of orthopaedics plays a pivotal role in addressing a myriad of conditions affecting the bones, joints, muscles, ligaments, and tendons. With the aging population, traumatic injuries, and lifestyle-related disorders on the rise, the Orthopaedics Inpatient Department stands at the forefront of managing a diverse patient demographic. Theprescription patterns within this specialized department not only reflect the evolving natureof orthopaedic care but also present an opportunity to enhance therapeutic outcomes and streamline healthcare practices.[7] The significance of this study extends beyond its regional scope, as orthopaedic conditions are pervasive globally. By examining the prescription patterns in a specific setting, we can draw parallels and contrasts with similar healthcare institutions worldwide, fostering a more comprehensive understanding of the challenges faced by orthopaedic practitioners universally. Consequently, the findings of this researchhave the potential to contribute to the development

of standardized guidelines, bestpractices, and improved global orthopaedic healthcare strategies.[8] A literature search wasconducted which consisted of a Medical Literature Analysis and Retrieval System Onlinedatabase search and a World Wide Web search using the following keywords: drug utilization study, orthopaedics, and OPD. The search revealed that there exists a paucity ofdata on the prescribing pattern in orthopedics OPD, particularly in India. Though the pattern of NSAIDs use in orthopaedics, OPD has been studied in India, data regarding overall drug utilization in orthopaedics OPD is absolutely lacking. A study with such objective has been conducted in Nepal , which was however limited by the fact that a totalnumber of prescriptions evaluated fell short of WHO guidelines on the conduct of drug utilization studies. In this backdrop, the present study was conducted to investigate the prescribing pattern in orthopedics OPD in a tertiary care medical college India using WHOsuggested prescribing indicators. [9] Studies on the utilization of drugs in the orthopaedicsdepartment are lacking in hospitals in India. Such studies are necessary to obtain baseline data on drug use and create a database for comparison with future studies. Hence, to give continuation to the effort of promoting Rational Use of Drugs (RUD) we have planned the present study. This study is aimed at assessing the drug prescribing trends in inpatients of orthopaedics department and recommend changes to improve prescribing pattern, if required.

MATERIALS AND METHODS

This prospective observational study was conducted for a period of three months fromNovember 2023 to January 2024 in Navodaya Medical College Hospital & Research Centre (NMCH & RC) Raichur. Permission was obtained from Institutional Ethics Committee of Navodaya Medical College Hospital and Research Centre. The study was approved by the committee by issuing ethical clearance certificate.

Data Collection : Data was collected using data entry form, case sheet. The data were documented in a predesigned case record form. It comprised patient demographics, clinical diagnosis, duration of hospital stay, and details on drugs prescribed which included total number of drugs prescribed, name and group of drugs, route of administration, number of antibiotics prescribed, number of fixed-dose combinations (FDCs), generic names of drugs (from Indian drug review 2015), and whether present in national list of essential medicines (NLEM, 2015) or not.

Inclusion Criteria:

Patients of all ages and both sexes were included.

Exclusion Criteria:

Those patients who were later admitted in wards of orthopedics department/other referred patients to orthopedics department by other departments

Sample Size: After applying inclusion & exclusion criteria, 100 patients were selected for thisprospective observational study in the year. Demographic data was then entered in pre decidedforms.

A specially designed structured data entry format was used to enter all patient details. Provisionis given in the format to enter investigations like diagnosis, drug therapy problems, comorbidities, drugs prescribed, drug interactions and any interventions. The information obtained from case files about study participants were kept confidential and only the collecteddata was processed. Based on the responses obtained, data were analysed.

The data from the study were analyzed using descriptive statistics namely total numbers, percentage and mean. Microsoft excel and word were used to generate graphs, tables and results etc.

Statistical analysis:

The analysis was carried out by descriptive statistics using SPSS Version 20. The results are expressed as

mean ± standard deviation, frequency, or percentages as applicable

RESULTS AND DISCUSSION

There were more male participants 73.16% (n=73) compared to the female group 26.84% (n=27). More patients were from the age group >60 years 25.70% (i.e. 20 males and 6 females).There were 23.08% patients from age group 21-30 years and the least from the age group <20years 11.62% (i.e. 10 male and 1 female patients). A total of 1216 drugs were prescribed. A brief description of the demographic data is presented.

Table 1: Age and sex wise distribution of total patient observed.

s	Male	Female	Total	Percentage
<20 years	10	1	11	11.62%
21-30 years	19	4	23	23.08%
31-40 years	10	3	13	12.92%
41-50 years	11	3	14	14.24%
51-60 years	3	10	13	12.44%
>60 years	20	6	26	25.70%
Total (Percentage)	73 (73.16%)	27 (26.84%)	611	100%

Table 2: Various diagnosis for which patients were admitted.

Diseases	Percentage
Fracture	58.43 (n=58)
PIVD	15.87 (n=16)
Dislocation	5.25 (n=5)
Pott's Spine	5.89 (n=6)
Rheumatoid Arthritis	4.58 (n=5)
Osteoarthritis	1.96 (n=2)
Others	8.02 (n=8)

Patients were most commonly admitted due to fractures in various body parts (58.43%). Nextcommon cause was PIVD which constituted 15.87% of patients.

Table 2: Different categories of drugs in prescriptions analyzed

Different categories of drugs in prescriptions analyzed	
Category of drug	Number (%)
Analgesics	27 (27.28)
Anti-peptic ulcer agents	17 (17.12)
Antimicrobial agents	16 (16.12)
Multivitamins	21 (20.68)
Drugs for neurological disorders	5 (4.51)
Drugs for cardiovascular disorders	4 (4.10)

Drugs for endocrine abnormalities	3 (2.55)
Cold and cough remedies	1 (0.13)
Miscellaneous	6 (6.24)

Table 3: Prescribing indicators

Prescribing indicators	
Average numbers of drugs per encounter	8.86
Percentage of drugs prescribed by generic name	28.8%
Percentage of encounter with an Antibiotic prescribed.	60.23%
Percentage of encounter with an Injection prescribed	63%
Percentage of drugs prescribed from Medicine List	52.63%
Percentage of drugs prescribed from WHO model List	32.46%

WHO prescribing indicators

Data of all the 100 patients was collected and analysed for the Prescribing Indicators. Total 1216 drugs were prescribed in 100 prescriptions. Average number of drugs per prescription was 7.34. Average duration of prescription was 9 days. Percentage of drugs prescribed by generic name was 29.7%. Percentage of encounter with an Antibiotic prescribed was 60.23% i.e. out of 100 prescriptions antibiotics were prescribed in 60. Percentage of encounter with an Injectionprescribed was 63% which means out of 100 prescriptions, injectables were prescribed in 63. Percentage of drugs prescribed from National Essential Medicine List was 51.63%. Percentage of drugs prescribed from WHO model List was 33.46%. Analysis of antibiotic use Total number of antibiotics prescribed were 106. Antibiotics were prescribed in 60 patients. Out of which 37 patients (37%) of them were prescribed two antibiotics. Four antibiotics in 3 patients (3%) have been prescribed and single antibiotic in 20 patients (20%). Average numberof antibiotic per patient was 2.3 and average duration of antibiotic prescription is 7.8 days.

Analysis of analgesic use

Total number of Analgesics prescribed were 165 which is 14% of total drugs. Average number of analgesics per prescription was 1.65 drugs per prescription. Incidence of polypharmacy wasquite high in context of Analgesics. Almost 20% of prescriptions had 2 drugs, 23% had 3 drugsand 4% had >3 drugs prescribed. Orally prescribed Analgesics were 62.6%, Injectables 34.38%and Topical 3.02%. Analgesics prescribed as FDC were 35.8%. Prescriptions with two or moreoral preparations were 28.68%. Gastro protective Agents were coprescribed in all instances toreduce or prevent the gastrointestinal irritation caused by NSAIDs.

Table 4: Patterns of use of NSAIDs

Number of patients/ drugs Category	(Percentage)
Incidence of polypharmacy (n=100)	
One drug	**7 (7%)**
Two drugs	**9 (9%)**
Three drugs	**19 (19%)**
>Three drugs	**65(65%)**
Route of administration (n=1216)	

Oral	**759 (62.4%)**
Injection	**414 (34%)**
Topical	**43 (3.6%)**

This is a prospective observational study conducted for 3 months, in Department ofOrthopedics, at Navodaya Medical College Hospital and Research Centre, Raichur. A total of 100 prescriptions were observed during the study period. A total of 1216 drugs were prescribed.It was observed that majority of patients were in the age group of >60yrs followed by 23.08%patients from age group 21-30 years. A greater proportion of older persons have been also seenin patients in previous studies done in northern India.[10] A possible reason could be the highproportion of old people develop age related bone changes which make them prone to fracturesafter trivial trauma. The next peak in age group of 21-30 years may be because this age groupis more active and communicating therefore there are more chances for them to meet accidents.

Sex wise distribution of patients shows that male patients (73 out of 100) were found more thanfemales (27 out of 100) in this study. This may be due to male dominance in society, as they are involved in outdoor activities and are earning members of the family, thus they are more exposed to trauma. The most common diagnosis in our study, for which patients were admitted was Fracture of different parts of body. The commonest indications were low back ache and spondylosis in study done in Nepal.[4] This may be because only out patients were included in their study. Thelow rate of prescribing of essential drugs is a matter of concern. Excessive use of multivitaminand combination preparations may be one of the factors responsible. It must be noted though that Essential drugs are primarily meant for primary healthcare systems while we studied drugutilization in a tertiary care hospital. Prescribing from WHO List was even lower (32.46%). The extensive use of the Diclofenac, which is not on the WHO list, may be contributory factor.Prevalence of Analgesics (NSAIDs) was 25.25% which is same when compared to various other studies done in urban setup, which has showed varied Analgesics (NSAIDs) prevalence pattern. In St. John's Medical College and Hospital Bangalore, frequency of Analgesics (NSAIDs) prescription was 24.52%. Similarly, study done in Dubai showed 23.4% of Analgesics (NSAIDs) prescription prevalence. However, study done in Raichur showed very less Analgesics prescription prevalence (14%).[12]

CONCLUSION

This study exposes a deficient level of rationality in the prescription patterns. It is crucial to establish clear standards for drug prescriptions and devise effective strategies to ensureadherence to these standards. Particularly, addressing issues like irrational polypharmacy and prolonged durations is imperative. One approach to tackle this is by making it obligatory for prescribers to regularly participate in Continuing Medical Education (CME) programs, ensuring they stay updated on current knowledge. CME should focus on instilling awareness about appropriate drug usage, potential adverse effects, and adherence to standard prescriptionguidelines, contributing significantly to rational drug prescriptions. Controlling the influence of pharmaceutical companies within healthcare institutions is essential to minimize their impact on drug prescriptions. Implementing these measures will significantly contribute to providing patients with optimal, affordable, and efficacious medications.

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CONFLICT OF INTEREST

The author declare no conflict of interest

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