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Assessment of Prescription Pattern of Drugs Prescribed in the Outpatient Department of a Private Orthopedic Hospital – A Cross-sectional Study

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Abstract

Background: Drug utilization research (DUR) is vital in the health sector as it offers insight into the efficacy of drug use. The findings of DUR studies can help set goals for the rational use of drugs and health-care funds distribution. **Objective:** The objective of this DUR study was to evaluate the prescription pattern of drugs prescribed in the outpatient department (OPD) of a private orthopedic hospital. **Settings and Design:** The study was a cross-sectional, prospective, and observational study conducted at the OPD of a private orthopedic hospital. **Materials and Methods:** The study was carried out over a 6-month duration (from October 2020 to March 2021) at the OPD of a private orthopedic hospital and studied 609 prescriptions using the World Health Organization (WHO) recommended prescribing indicators. **Statistical Analysis Used:** Microsoft Excel and SPSS version 26.0 were used to capture and analyze the data of the study. **Results:** A total of 3082 drugs were prescribed in 609 prescriptions. The average number of drugs prescribed per encounter was 5.1 (SD = 1.9). Drugs prescribed using generic name of the drug were 2.6%, the encounters with an antibiotic and an injection prescribed were 39.4% and 7.1%, respectively. The drugs prescribed from the essential drugs list were 38.9%. In addition, vitamins and supplements (32.1%) were prescribed the most followed by analgesics (24.2%) and antacids (16.6%). **Conclusions:** The study highlighted the inadequate compliance with the WHO recommended prescribing indicators and suggested a need to train physicians and spread awareness about writing rational prescriptions, benefitting the patient.

Keywords: Generic drugs, Irrational, Orthopedic, Prescribing pattern, Use of drugs, World Health Organization indicators

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Introduction

Drug utilization research (DUR) is critical in clinical practice as it allows for more rational drug usage. It is used to make changes to hospital drug prescribing procedures and aids in developing plans for the most effective use of health services. Periodic conduct of utilization studies of drugs helps to minimize the irrational prescribing practices.[1-3] The World Health Organization (WHO) defines DUR as "the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences." Three DUR studies provide an evidence-based approach for making policy decisions at various levels in the health-care system. These studies conducted in outpatient settings are practical tools that help evaluate the prescribing habits and cost-effectiveness of treatment. One of the methods to carry out a DUR study is to analyze the prescription pattern. The study of prescribing patterns seeks to monitor, evaluate, provide feedback, and suggest modifications in the prescribing behavior of medical practitioners to achieve rational drug use.[4,5]

Studying prescribing pattern in different diseases is essential to identify rational or irrational drug therapy in clinical practices. Studies conducted in orthopedic hospital have identified severe adverse events such as gastrointestinal bleeding or the reason for hospitalization associated with drugs like nonsteroidal anti-inflammatory drugs (NSAIDs); hence, a check and monitoring on the use of these drugs at regular interval is essential.[6,7] Many of India's DUR studies in orthopedic hospitals are mainly carried out in government hospitals.[8-10]

However, only a few studies evaluating prescribing pattern at private clinics and hospitals, especially at specialty hospitals like orthopedic, are conducted in India's Western region. The present study assessed the prescribing pattern of drugs using the WHO prescribing indicators at an outpatient department (OPD) of a private orthopedic hospital in the suburban region of Pune, India.

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Materials and Methods

This prospective, observational, and cross-sectional study was conducted from October 2020 to March 2021 for 6 months at a private orthopedic hospital located in the suburban region of the Pune district of Maharashtra, India. Independent Ethical Committee approval was obtained before initiating this study. The study's details were explained to the participants, and written informed consent was obtained from patients before capturing their prescription data. The present study is prospectively registered with the Clinical Trials Registry of India (CTRI), and the registration number is CTRI/2020/10/028303.

Prescriptions provided for either of the genders, for any age, and any clinical diagnosis with at least one drug prescribed were included in the study. Patients attending the outpatient facility for follow-up (who may or may not be enrolled previously), referral patients, intellectual disability, and patients not willing to give informed consent were excluded from the study. All the patients who meet the inclusion criteria were enrolled in the study after taking informed consent before commencing the study. The information available on the prescription form (filled by the physician) were captured in the study, and patients were not asked any question in the current study. Information like demographics characters (age, sex, and weight) present on the prescription form was captured in a predefined format, data analysis and reporting were done using descriptive analysis and statistics.

Parameters for Evaluation

The parameters included were demographic characteristics such as age and gender and five WHO recommended prescribing indicators, that is,

1. The average number of drugs per encounter
2. Percentage of drugs prescribed by generic name
3. Percentage of encounters with an antibiotic prescribed
4. Percentage of encounters with an injection prescribed
5. Percentage of drugs prescribed from essential drugs list (EDL) or formulary.

Analysis of Data

The collected data were entered into Microsoft Excel and analyzed using SPSS version 26 (SPSS for Windows, Version 26.0., Chicago, SPSS Inc.).

Results

Demographics

Patients' demographic information (such as age, sex, and weight) and drug-related information, such as drug name, strength, frequency, date of prescription, diagnosis, and prescriber's name, were stated in all of the prescriptions reviewed. A total of 609 prescriptions were studied in the current study, from which 298 (48.9%) prescriptions were prescribed for female patients. The mean age group identified in the current study was 41.8 (SD ± 17). The information related to the distribution of age group is given in Table 1.

Prescribing Pattern

A total of 3082 medicines were prescribed in 609 prescriptions. Drugs were prescribed in a range of 1–12 in the 609 prescriptions studied; out of these, 23 (3.8%) prescriptions had only one drug prescribed while only 2 prescriptions (0.3%) contained 12 drugs prescribed [Table 2].

WHO Prescribing Indicators

The average number of drugs per prescription was 5.1 (SD = 1.9). The percentage of drugs prescribed in the generic name was 2.6%, whereas the percentage of encounters with an antibiotic and injection was 39.4% and 7.1%, respectively. About 38.9% of drugs prescribed in the current study were on the national list of essential medicines [Table 3].

From the total of 3082 drugs prescribed, vitamins and supplements were the highly prescribed drugs 989 (32.1%) followed by analgesics 747 (24.2%) and antacids drugs 512 (16.6%). A total of 240 (7.8%) antibiotics drugs were prescribed in the current study, and the most commonly prescribed antibiotics were a fixed-dose combination of amoxicillin and clavulanate 79 (31.0%). The percentage of fixed-dose drug combinations (FDCs) prescribed was 55.5% of the total drugs prescribed. Tablets were the most prescribed dosage form 2142 (69.5%), followed by capsules 783 (25.4%), injections 73 (2.4%), and gel, ointment, and creams 51 (1.7%) [Table 4].

Discussion

The current prospective, cross-sectional, and observational study conducted at the OPD of a private orthopedic hospital summarizes the prescribing pattern of drugs using WHO prescribing indicators. The percentage of the male patients visiting the orthopedic OPD in the present study was higher (51.1% vs. 48.9) compare to the female patient; however, this finding is similar to the findings from other studies.[12,13] The total number of drugs prescribed in this study was 3082 in 609 prescriptions, the maximum belonging to group vitamins and supplements, analgesics, and antacids. The average number of drugs prescribed was 5.1 (optimal value of 1.6–1.8).

Our findings were similar to a study conducted in Madhya Pradesh (5.1).[14] However, this value was lower in other orthopedic

Table 1: Age-wise distribution of patients treated with antibiotics

Age (years)	*Number of patients (n=609)*	*Percentage*
<18	23	3.8
18–35	237	38.9
36–60	266	43.7
>60	83	13.6

Table 2: Summary report of the number of drugs per encounter

Number of drugs per encounter	*Frequency*	*Percentage*
One drug	23	3.8
Two drugs	15	2.5
Three drugs	61	10.0
Four drugs	129	21.2
Five drugs	179	29.4
≥Six drugs	202	33.2

Table 3: Summary of the WHO prescribing indicators results

WHO prescribing indicators	*Total drugs/ encounters*	*Average/ percent*	*WHO recommended standard[11](%)*
The average number of drugs per encounter	3082	5.1	(1.6–1.8)
Percentage of encounter with antibiotics	240	39.4	(20.0–26.8)
Percentage of encounters with injection	63	7.1	(13.4–24.1)
Percentage of drugs prescribed by generic	80	2.6	100
Percentage of drugs from essential drug list	1520	38.9	100

Table 4: Summary of frequently prescribed drugs (*n*=3082) and antibiotics drugs (*n*=240) in the study

Frequently prescribed medicine	*Frequency (percentage)*	*S. No.*	*Frequently prescribed antibiotics*	*Frequency (%)*
Rabeprazole	456 (14.8)	1	Amoxicillin and clavulanate	79 (31.0)
Aceclofenac +Paracetamol+Serratiopeptidase	381 (12.4)	2	Cefuroxime	54 (21.2)
Calcium supplements	310 (10.1)	3	Metronidazole	42 (16.5)
Mecobalamin+folic acid supplements	297 (9.6)	4	Amikacin	12 (4.7)
Flupirtine	266 (8.6)	5	Ciprofloxacin	12 (4.7)

DUR studies conducted in Uttar Pradesh (2.9) and Nepal (2.9).[15,16] Further, the results showed that polypharmacy was another area of concern as 5 and more >5 drugs were prescribed in 29.4% and 33.2% of prescriptions; this finding is similar to the one reported by Singh *et al*. (49.0%).[8] These results violate the WHO principles and need to be addressed with strict adherence to the protocol. Polypharmacy can be attributed to many factors such as the absence of proper treatment guidelines or pharma company incentives prescribing. An increase in the number of prescribed drugs may also lead to non-compliance of the patients for drugs and a higher risk of adverse events, and in turn, it adversely increases the cost of the treatment.

In our study, the percentage of drugs prescribed in the generic name was 2.6% (optimal value of 100%). Alarming figures have also been found in several other studies conducted by Ingle *et al*. (0%),[17] Nagla *et al*. (2%),[14] and Ubedulla *et al*. (4.25%).[18] Similar findings have resulted from studies performed in UAE (3.1)[19] and Bangladesh (0%).[20] Most of the DUR studies conducted in the orthopedic setting reported less the optimal percentage of drugs prescribed in a generic name and can be readdressed to some extent by prescribers' education. According to the WHO, prescribing drugs in generic names are minimized the need to buy a particular brand product; it also helps to have accurate communication among the patient and health-care providers.[21]

The percentage of encounter with antibiotics was 39.4% in the current study, and this finding was similar to a study from West Bengal, India, in which antibiotics consisted of 31.17%[22] of total drugs prescribed. However, a study from Ghana reported that 55.2% of prescriptions prescribed with antibiotics.[23] The current study finding is well above the WHO recommended optimal value and needs urgent attention. Antibiotics are one of the most effective drugs available in the treatment of bacterial infections. In the current age of medicine, they are the most commonly used medicines. The overuse of antibiotics usage leads to antibiotic resistance, adverse drug reactions, and hospitalization.[24]

In our study, prescriptions with injections amounted to 7.1%, which is acceptable and less than the WHO standard value (13.4–24.1%) [Table 3]. This is an encouraging factor, comparatively less than the finding reported by Ingle *et al*. (17.21%);[17] however, many other studies reported lower use of injectable in the OPD setting of orthopedic hospitals.[14,15,25] Compared to oral dosage forms, injections are costly, and their use may increase the risk of transmitting blood-borne infections such as syphilis, hepatitis, and human immunodeficiency. Hence, the use of injections should be the least and in emergencies.

The present study reported that 38.9% of drugs were prescribed from the essential drug list, which is lower than those reported in studies conducted by Nagla *et al*. (84.0%)[14] and Saborni *et al*. (85.9%).[15] Prescribing drugs from EDL are good practices as drugs in the EDL are established and cost effective, and with better availability in the market.[21]

One of the most commonly used drug class in the current study was NSAIDs [462 (15.0%)]. In this study, anti-ulcer drugs [512 (16.6%)] were prescribed more than NSAIDs indicating that anti-ulcer drugs were routinely prescribed along with the NSAIDs at our center, minimizing the adverse effects associated with the use of NSAIDs in orthopedic treatment. The 1.6% of anti-ulcer drugs prescribed can be attributed to other ailments related to stomach ulcer. The current study reported 55.5% of prescribed drugs as FDCs. This finding was higher than reported by Sini *et al*. (34.5%).[26] It is known that the irrational use of FDCs may cause adverse events, increase drug costs, and encourage the emergence of drug-resistant strains of microorganisms in the case of antimicrobials. Hence, awareness of physicians in prescribing rational FDCs was the need of the hour.[27,28]

In the current study, all prescriptions contained the dosage form, dose frequency, and treatment duration. The limitation of this study was that it did not encompass the adverse effect of the drugs prescribed. Nevertheless, the current study highlighted the irrational prescribing practices at the private orthopedic OPD setting. One of the study's encouraging findings was that the percentage of encounters prescribing with injection was within the ideal range. However, the other results of the study deviated from the established standards. Based on these findings, it is recommended that continuous education and training of physicians should be planned to promote the rational prescribing of drugs.

Conclusions

The present study conducted at the private OPD of a orthopedic hospital revealed polypharmacy, the higher percentage of antibiotics prescribed, negligible generic prescribing, as well as lower prescription of drugs from NLEM; however, promising findings were noted for fewer encounters with injections. Based on these findings, the study recommends that continuous education and training of physicians should be planned to promote the rational prescribing of drugs.

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