Prescription Pattern Audit amongst Inpatients in a Tertiary Care Teaching Hospital in East Sikkim

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ABSTRACT

This study discusses the issue of prescribing errors in hospitals, which are reported to affect a significant percentage of patients and are one of the most common causes of patient safety incidents. Hence the study describes a study conducted in a tertiary care teaching hospital in East Sikkim, India, that aimed to assess the quality of hospital prescriptions for completeness, legibility, and WHO recommended indicators. To attain the objective of the study, the study used 200 patients. The study found a diverse patient population with varying demographics, medical conditions, departmental needs, drug and prescription requirements, and antibiotic usage. Poor prescribing practices, including polypharmacy and non-compliance with dosing schedules, can result in dangerous medication, illness aggravation, health risks, financial strain, and resource waste. Strategies for preventing medication errors include prescription auditing, the implementation of medical guidance rules, public awareness regarding prescription drugs, and avoiding receiving monetary incentives from pharmaceutical firms. These findings can be useful for healthcare professionals and policymakers in developing effective treatment plans and strategies to address the needs of such patient populations.

KEYWORDS

Audit pattern, East Sikkim, Prescribing errors, Tertiary care, Teaching hospital

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INTRODUCTION

Prescribing errors are reported to affect 1%–100% of all patients admitted to hospital and are the second most common cause of patient safety incidents [1,2]. The National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) has defined Medication Errors (MEs) as, "Any preventable event that may cause or lead to inappropriate medication use or patient harm, while the medication is in the control of the health care professional, patient, or consumer" [3]. Specifically, irrational prescription is an international issue. The rationality of prescribing practices is significant as poor prescription behaviors, such as the abuse, underuse, and overuse of medications, might result in dangerous medication, illness aggravation, health risks, financial strain on people, and resource waste. Polypharmacy, the administration of antibiotics for conditions other than bacterial infections, insufficient dosage, self-medication, the overuse of syringes while oral alternatives are acceptable and accessible, and non-compliance with dosing schedules are a few instances of unjustified pharmaceutical use. Irrational prescriptions often increase the cost and duration of the treatment. There are many strategies for preventing such medication errors, including the creation of advisory boards to integrate drug policy, the proper enforcement and implementation of medical guidance rules, the creation and application of a national essential medicines list, public awareness regarding prescription drugs, and avoiding receiving monetary incentives from pharmaceutical firms. Significantly, Prescription audit is a component of professional responsibility, and the quality of care and ideas like professional judgement or clinical autonomy are being called into question more frequently in society [4]. It is a quality improvement method to enhance the care of patients [5,6]. As per the statement of NICE a prescription audit is a part of clinical audit which focuses on quality improvement cycle that involves measurement of the effectiveness of healthcare against agreed and proven standards for high quality, and taking action to bring practice in line with these standards so as to improve the quality of care and health outcomes. Prescription auditing is also an educational activity, and if regularly done, can aid in improving the prescription quality and thus can enable the patient to receive high standard and best-quality care [7]. The WHO has developed a set of "key prescription parameters" to help outpatient practice utilize drugs more cautiously [8]. It contains the indicators related to prescription, patient care, and facilities. Research has been done all throughout the world, including India, focused upon those indicators [9-12]. This study has been conducted because of there is no prescription audit study that has been carried out in Sikkim context, therefore researcher wanted to highlight the quality of hospital prescriptions for completeness, legibility and WHO recommended indicators in this remote part of India.

MATERIALS AND METHODS

This study was designed and conducted as a prospective observational study in a tertiary care teaching hospital in East Sikkim after taking ethical clearance from the Institutional Ethics Committee. This study was carried out over a period of three months from mid-March 2019 to mid-June 2019. A pre-designed pretested schedule was employed that contained information on socio-demographic, economic variables along with questions for assessing the usage of drugs along with a suspected ADR (Adverse Drug Reactions) form devised by the CDSCO (Central Drugs Standard Control Organization) also attached with it. This pilot study was carried out in the hospital pharmacy, Central Referral Hospital (CRH) and Medical Records Department (MRD), CRH and accordingly few modifications were done. Minimum of twice in a week, data were collected. The I.P.D prescription slips and patient case sheets were screened during the study period and only one prescription per patient were included. Overall, 200 prescriptions were randomly sampled and the details of the prescriptions were analyzed on following parameters:

Prescription format and its completeness with regards to:

- Patient details: (Name, age, sex, Registration no., date of consultation and legibility).
- Medical components (brief history, presumptive/definitive diagnosis, investigations, correct dose and dosage, duration of treatment, legible signature, and medical council registration no.).

The WHO core drug indicators were taken into consideration and divided into 3 main categories:

1. **Prescribing indicators**
   - Average number of drugs per prescription.
   - Percentage of drugs prescribed by generic name.
   - Percentage of prescriptions containing anti-microbial agents.
   - Percentage of injections per prescription.
   - Percentage of drugs prescribed from EDL.
2. **Patient care indicators**
   - Average Consultation time (excluding waiting time).
   - Average Dispensing time (excluding waiting time).
   - Percentage of drugs dispensed.
   - Percentage of drugs adequately labeled.
   - Patient's knowledge of correct dosage.
3. **Health facility indicators**
   - Availability of copy of EDL in all OPDs.
   - Availability of key drugs.
   - Availability of ADR forms in all OPDs.

Availability of a copy of EDL and ADR forms in all OPDs, IPDs and in-stock availability of key drugs identified by hospital authorities was randomly checked.

RESULTS

The demographic details of patients in a certain study or population. It includes information about the patients' age, sex distribution, and address. Here is a breakdown of what each column represents; age details of patients was investigated in the study in Table 1. The data is divided into three categories: patients less than or equal to 18 years old, patients between 19 and 59 years old, and patients over 60 years old. The table shows that 19 patients (9.5%) were less than or equal to 18 years old, 145 patients (72.5%) were between 19 and 59 years old, and 36 patients (18.0%) were over 60 years old. The sex distribution of the patients in the study was also examined. The data is divided into two categories: female and male. The table shows that 114 patients (57.0%) were female and 86 patients (43.0%) were male. Address details of the patients was divided into two categories: mentioned and not mentioned. The table shows that 114 patients (57.0%) had their addresses mentioned in the study and 86 patients (43.0%) did not have their addresses mentioned.

	Description	Frequency	Percent
Age	Less than equal to 18 years	19	9.5
	19-59 years	145	72.5
	More than 60 years	36	18
Sex distribution	Female	114	57
	Male	86	43
Address	Mentioned	114	57
	Not mentioned	86	43

Table 1. Demographic Details of the Patients

The most common diagnosis pattern is ear infection with 15 percent, followed by Respiratory, Urinary Tract Infection and Eye infection with 12% each, GI with 11.5%, Nutritional Deficiency and diseases with 11% was noted in Table 2. The least common diagnosis pattern is CVS and Hypersensitivity reactions with 1.5% each, followed by Infections in Burns and Plastic Surgery and Fungal Infection with 2% each, Endocrine and Metabolic diseases with 2.5%, CNS with 3%, Bones and Joint Infection with 5%, and Obstetric and gynaecological Infection with 6%.

	Frequency	Percent
CVS	3	1.5
Respiratory	24	12
CNS	6	3
GI	23	11.5
Skin And Soft Tissue Infection	6	3
Urinary Tract Infection	24	12
Obstetric and gynaecological Infection	12	6
Bones and Joint Infection	10	5
Eye Infection	24	12
Ear Infection	30	15
Infections in Burns and Plastic Surgery	4	2
Fungal Infection	4	2
Endocrine and Metabolic diseases	5	2.5
Nutritional Deficiency and diseases	22	11
Hypersensitivity reactions	3	1.5
Total	200	100

Table 2. Diagnosis Pattern

The frequency and percent distribution of patients by department in a hospital or healthcare facility. Table 3 shows that out of a total of 200 patients, the largest numbers of patients (79 or 39.5%) were admitted to the Medicine department. The second most common department was Surgery, with 42 patients (21.0%). The table also indicates that 12 patients (6.0%) were admitted to Pediatrics, 36 patients (18.0%) to Orthopedics, 14 patients (7.0%) to ENT, 6 patients (3.0%) to EYE, 2 patients (1.0%) to Dermatology, and only 1 patient (.5%) to Respiratory Medicine. Additionally, 8 patients (4.0%) were admitted to Emergency/Casualty.

	Frequency	Percent
Medicine	79	39.5
Surgery	42	21
Pediatrics	12	6
Orthopedics	36	18
ENT	14	7
EYE	6	3
Dermatology	2	1
Respiratory Medicine	1	0.5
Emergency/Casualty	8	4
Total	200	100

Table 3. Number of Patients Admitted to Medicine department

Table 4 presents the frequency and percent distribution of the number of drugs or prescription profiles in a sample of 200 patients. The table shows that the majority of patients (48 or 24.0%) received only one drug or prescription profile. The next most common number of drugs/prescription profiles per patient was two, with 38 patients (19.0%) receiving two drugs/prescription profiles. The frequency and percent distribution of patients receiving more than two drugs/prescription profiles gradually decreases, with 22 patients (11.0%) receiving three drugs/prescription profiles, 27 patients (13.5%) receiving four drugs/prescription profiles, 20 patients (10%) receiving five drugs/prescription profiles, 12 patients (6%) receiving six drugs/prescription profiles, 11 patients (5.5%) receiving seven drugs/prescription profiles, 7 patients (3.5%) receiving eight drugs/prescription profiles, 5 patients (2.5%) receiving nine drugs/prescription profiles, 4 patients (2%) receiving ten drugs/prescription profiles, 2 patients (1%) receiving eleven drugs/prescription profiles, 1 patients (0.5%) receiving twelve drugs/prescription profiles, 1 patients (0.5%) receiving fifteen drugs/prescription profiles, and 2 patients (1%) receiving eighteen drugs/prescription profiles.

S.No	Frequency	Percent
1	48	24
2	38	19
3	22	11
4	27	13.5
5	20	10
6	12	6
7	11	5.5
8	7	3.5
9	5	2.5

10	4	2
11	2	1
12	1	0.5
15	1	0.5
18	2	1
Total	200	100

Table 4. Number of Drugs/Prescription Profiles

Table 5 shows the frequency and percentage distribution of the number of antibiotics prescribed per patient in a sample of 200 patients. Out of the 200 patients, 103 (51.5%) did not receive any antibiotics, while 76 (38.0%) received one antibiotic. Twenty patients (10.0%) received two antibiotics, and only one patient (.5%) received three antibiotics.

S.No	Frequency	Percent
0	103	51.5
1	76	38
2	20	10
3	1	0.5
Total	200	100

Table 5. Number of Antibiotics

In this case, 103 out of 200 prescriptions (51.5%) did not involve the prescription of any antibiotics, while the most prescribed category of antibiotics was 3rd Generation Cephalosporins, accounting for 59 out of 200 prescriptions (29.5%) in Table 6. The other categories of antibiotics were prescribed at a lower frequency, ranging from 1 to 15 prescriptions, with corresponding percentages ranging from 0.5% to 7.5%.

	Frequency	Percent
Not applicable	103	51.5
3rd Generation Cephalosporins	59	29.5
Nitroimidazoles	14	7
Aminoglycoside	8	4
Penicillins and its congeners	4	2
Sulfonamides and Cotrimoxazole	2	1
Fluoroquinolones	2	1
Macrolides	15	7.5
Tetracycline and Chloramphenicol	2	1
Anti-Helminthic	4	2
Anti-Fungal	1	0.5
Anti- Viral	2	1
Anti-Parasitic/ Anti-Malarial	1	0.5
Anti-Tubercular	2	1

Table 6. Common Categories of Antibiotics Prescribed to Outpatients

According to the Table 7, 68 patients (34.0%) did not receive any drugs prescribed by generic names, 66 patients (33.0%) received one drug prescribed by generic name, 26 patients (13.0%) received two drugs prescribed by generic names, 13 patients (6.5%) received three drugs prescribed by generic names, 13 patients (6.5%) received four drugs prescribed by generic names, 7 patients (3.5%) received five drugs prescribed by generic names, 2 patients (1.0%) received six drugs prescribed by generic names, 2 patients (1.0%) received seven drugs prescribed by generic names, 2 patients (1.0%) received eight drugs prescribed by generic names, and 1 patient (0.5%) received eleven drugs prescribed by generic names.

S.No.	Frequency	Percent
0	68	34
1	66	33
2	26	13
3	13	6.5
4	13	6.5
5	7	3.5
6	2	1
7	2	1
8	2	1
11	1	0.5
Total	200	100

Table 7: Number of Drugs Prescribed to Patients by Generic Names

Table 8 presents the frequency and percentage of existing co-morbid conditions among the patients. The categories of co-morbid conditions and their corresponding frequencies and percentages are as follows: Not applicable: 159 (79.5%), DM: 26 (13.0%), HTN: 19 (9.5%), Hypokalemia: 1 (0.5%), Hypothyroidism: 3 (1.5%), Asthma: 1 (0.5%), COPD: 1 (0.5%), Joint diseases: 2 (1.0%), heart diseases: 1 (0.5%), and Psychiatric condition: 2 (1.0%). The category "Not applicable" may refer to patients who did not have any existing co-morbid conditions or for whom co-morbid conditions were not recorded. The majority of patients (79.5%) fall under this category. The most common co-morbid condition observed among patients is DM, with a frequency of 26 (13.0%).

	Frequency	Percent
Not applicable	159	79.5
DM	26	13
HTN	19	9.5
Hypokalemia	1	0.5
Hypothyroidism	3	1.5
Asthma	1	0.5
COPD	1	0.5
Joint diseases	2	1
Heart Diseases	1	0.5

Psychiatric Condition	2	1

Table 8. Existing Co-Morbid Conditions of Patients

DISCUSSION

One of the main focuses in health care is giving the correct medication to the correct patient at the right moment. The WHO's advice on sensible drug policy must be put into practice in order to achieve this. Drug prescription practices that have effects on health, society, and the economy are what lead to responsible drug usage. The cornerstone of quality management in institutions is prescription auditing. It must deal with issues that can result in major negative effects for patients if correct care is not provided, plan crucial drug selection, and determine the community's drug requirements. For the decision-making and policy-writing processes, health administration, producers, dealers, and organizations of health experts will find the audit data to be of considerable value.

The analysis provides important information about the demographic details of patients, the most common diagnosis patterns, the frequency, and percent distribution of patients by department, the number of drugs or prescription profiles, the number of antibiotics prescribed per patient, the category of antibiotics prescribed, and the number of drugs prescribed by generic name.

The demographic details of patients indicate that the study included a total of 200 patients, with 72.5% of patients aged between 19 and 59 years, 57% of patients being female, and 57% of patients having their addresses mentioned in the study. With regards to gender, the study identified female was the highest person who getting more prescriptions than males [13,14]. However, the study by Sunny et al. [15], states the male was highest respondent than female at 52%. In terms of age, the study examined the highest number of participants are between 19 and 59 years. The average age of patients between 31-80 years in the study of Pavani et al. [16]. This information can be used to understand the patient population being studied and can help in making informed decisions about healthcare services and treatments.

The most common diagnosis pattern observed in the study is ear infection with 15%, followed by Respiratory, Urinary Tract Infection, and Eye infection with 12% each. Hussain et al. [17] stated the highest diagnosis pattern are respiratory system at 28.3%. Similarly, Bandyopadhyay et al. [18], stated gastro intestinal system are major diagnosis pattern. This information can be used to guide the diagnosis and treatment of patients, as well as to allocate healthcare resources more effectively. The frequency and percent distribution of patients by department in a hospital or healthcare facility shows that the largest number of patients (39.5%) were admitted to the Medicine department, followed by surgery with 21% of patients. Mukhopadhyay et al. [19], revealed outpatient department are major department in a hospital obtain more prescriptions. This information can be used to evaluate the utilization of healthcare resources and to plan for future resource allocation.

The number of drugs or prescription profiles and the number of antibiotics prescribed per patient provide important insights into the healthcare practices and trends in the study. Many patients received only one drug or prescriptions profile, and 51.5% of patients did not receive any antibiotics. Additionally, 29.5% of patients received 3rd Generation Cephalosporins, the most prescribed category of antibiotics.

The number of drugs prescribed by generic name is an important indicator of the cost-effectiveness of healthcare services. The table shows that 34% of patients did not receive any drugs prescribed by generic names, indicating that there is scope for improving the cost-effectiveness of healthcare services.

Overall, the analysis provides valuable information that can be used to evaluate healthcare practices and resource allocation, guide the diagnosis and treatment of patients, and improve the cost-effectiveness of healthcare services.

CONCLUSION

Based on the findings, it can be concluded that the study or population analysed had a diverse range of patients, with varying demographics, medical conditions, departmental needs, drug and prescription requirements, and antibiotic usage. The patient population analysed had a relatively equal distribution between males and females, with the majority falling in the age range of 19-59 years old. Ear infections were the most common diagnosis pattern observed, followed by respiratory, urinary tract, and eye infections. The medicine department saw the highest number of patients, followed by Surgery and Orthopedics. In terms of drug and prescription requirements, the majority of patients received only one drug or prescription profile, while 51.5% did not require any antibiotics. Among the patients that received antibiotics, 3rd Generation Cephalosporins were the most commonly prescribed. Furthermore, the majority of patients did not receive drugs prescribed by generic names. Overall, these findings provide insight into the demographic and medical characteristics of a patient population, as well as the various needs and requirements of patients in terms of departments, drug and prescription profiles, and antibiotic usage. These findings can be useful for healthcare professionals and policymakers in developing effective treatment plans and strategies to address the needs of such patient populations.

RECOMMENDATIONS

Based on the conclusion, there are several recommendations that can be made for future studies or healthcare practices:

- Further studies should be conducted to investigate the reasons behind the high prevalence of ear infections among the patient population analysed. This can help healthcare professionals develop more effective treatment plans for patients with ear infections.
- Healthcare professionals should be mindful of the varying medical conditions and needs of patients in different departments. This can help ensure that patients receive the appropriate care and treatment for their specific medical conditions.
- Healthcare providers should consider the prescription and drug needs of patients when developing treatment plans. This includes considering the use of generic drugs, as well as the potential risks associated with antibiotic overuse.
- Policymakers should consider the demographic

characteristics and medical needs of patient populations when developing healthcare policies and regulations. This can help ensure that patients receive appropriate and effective care, regardless of their demographic characteristics.

- Further studies should be conducted to investigate the efficacy and safety of 3rd generation cephalosporins, given that they were the most commonly prescribed antibiotics in the patient population analysed. This can help inform healthcare professionals about the appropriate use of these antibiotics, and potential risks associated with overuse.

Overall, the findings of this study provide valuable insight into the medical characteristics and needs of a patient population. By considering these findings and implementing appropriate measures, healthcare professionals and policymakers can work towards providing more effective and efficient care for patients

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