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Research Article

PRESCRIPTION AUDIT AT A TERTIARY CARE HOSPITAL – A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: The aim of this study was to analyze prescribing practices at Silchar Medical College and Hospital (SMCH) through a cross-sectional audit of 600 outpatient prescriptions, adhering to the National Health Mission Prescription Audit Guidelines 2021.

Methods: The audit examined prescriptions of patients who visited the Outpatient department (OPD) of Department of General Medicine, Surgery, Orthopedics, Gynecology and Obstetrics, Pulmonary Medicine, Pediatrics, Dermatology, and Psychiatry. The audit evaluated key aspects such as the completeness of patient information, legibility of prescriptions, documentation of clinical details, and adherence to standard treatment guidelines (STG).

Results: The prescription audit at SMCH revealed high compliance with essential criteria such as OPD registration and patient gender documentation. However, gaps were identified in areas such as allergy status documentation (0%), legible handwriting (75.7%), and follow-up advice (16.9%). In addition, adherence to STG was observed in 75% of prescriptions, with a concerning finding that there was a lack of facility's Antibiotic Policy.

Conclusion: The study underscores the importance of complete and accurate prescription documentation to ensure patient safety and effective treatment.

Keywords: Prescription audit, Rational drug use, National health mission, Guidelines, Healthcare quality.

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INTRODUCTION

The rational use of medications is a cornerstone of effective healthcare delivery, particularly in tertiary care hospitals where the patient load and complexity of cases are significantly higher. Prescription audits are critical in assessing prescribing patterns and ensuring adherence to established treatment guidelines, which is vital for optimizing patient outcomes and minimizing the risk of adverse drug reactions (ADRs) and medication errors [1,2].

Rational drug use entails prescribing the right medication, at the right dose, for the right duration, to the right patient, and at an affordable cost [1]. It encompasses the selection of medications based on evidence-based guidelines, consideration of patient-specific factors such as age, comorbidities, and potential drug-drug interactions, and the promotion of generic prescribing. Prescription audits serve as an essential tool in evaluating adherence to these principles, identifying areas for improvement, and implementing corrective measures [3].

Tertiary care hospitals, as referral centers, manage complex and diverse patient populations. The volume and diversity of cases necessitate meticulous prescription practices to avoid polypharmacy, preventable ADRs, and therapeutic duplications [4]. Several studies have underscored the prevalence of irrational prescribing in such settings, highlighting issues such as overprescription of antibiotics, inappropriate dosing, and neglect of patient-specific factors. Prescription audits help in identifying such issues and fostering a culture of continuous quality improvement [5,6].

The World Health Organization (WHO) has emphasized the need for rational drug use globally. According to the WHO, more than 50% of all medications are prescribed, dispensed, or sold inappropriately, and 50% of patients fail to take them correctly. These statistics underscore the importance of regular prescription audits to ensure compliance with guidelines and to educate healthcare providers on rational prescribing practices [7].

Several challenges impede rational prescribing in tertiary care settings. These include inadequate knowledge of treatment guidelines, high patient load, pressure from patients for specific medications, and the influence of pharmaceutical marketing. In addition, factors such as the lack of regular training programs for healthcare providers and the absence of stringent monitoring mechanisms contribute to irrational prescribing practices. Prescription audits can identify these challenges and recommend targeted interventions [8,9].

The advent of electronic prescribing systems (e-prescribing) has revolutionized medication management in hospitals. E-prescribing systems enhance the accuracy of prescriptions, reduce medication errors, and improve adherence to treatment guidelines by providing decision support tools for clinicians.

Education and training of healthcare providers are pivotal in promoting rational prescribing. Continuous medical education (CME) programs, workshops, and seminars focused on the principles of rational drug use and the importance of adherence to treatment guidelines can significantly improve prescription practices. Studies have shown that targeted educational interventions for prescribers can lead to sustained improvements in prescribing behavior and patient outcomes [10,11].

ADRs are a major concern in hospital settings, contributing to increased morbidity, mortality, and healthcare costs [12]. Prescription audits play a crucial role in identifying potential ADRs and implementing strategies to prevent them. For instance, audits can highlight the inappropriate use of high-risk medications in elderly patients, prompting the adoption of safer alternatives. Furthermore, regular audits can facilitate the development of hospital-specific guidelines for managing common ADRs, thereby improving patient safety [13].

The overuse and misuse of antibiotics are significant contributors to the global problem of antimicrobial resistance (AMR). Prescription audits are integral to antibiotic stewardship programs, which aim to optimize the use of antibiotics to combat AMR. By evaluating antibiotic prescribing patterns, audits can identify instances of unnecessary or inappropriate antibiotic use and promote adherence to evidence-based guidelines. Studies have shown that antibiotic stewardship programs incorporating regular audits lead to reduced antibiotic consumption and lower rates of AMR [14,15].

Polypharmacy, the concurrent use of multiple medications, is common in tertiary care settings, particularly among elderly patients and those with multiple comorbidities [16,17]. While polypharmacy is sometimes necessary, it increases the risk of ADRs, drug-drug interactions, and medication non-adherence. Prescription audits help in identifying and addressing polypharmacy by reviewing the necessity of each medication and recommending deprescribing where appropriate [17]. The objective of the study is to analyze prescribing practices at Silchar Medical College and Hospital (SMCH) through a cross-sectional audit of 600 outpatient prescriptions, adhering to the National Health Mission Prescription Audit Guidelines 2021.

METHODS

Study design

The study was designed as a prospective, observational, and cross-sectional study. This approach allowed for the collection of real-time data on prescribing practices and errors, providing a snapshot of current prescription trends and issues within a defined period. The observational nature of the study ensured that the data collected reflected the actual prescribing behavior of healthcare providers without intervention.

Study setting

The study was conducted at SMCH, specifically targeting the Out Patient Departments (OPDs) of General Medicine, Surgery, Orthopedics, Gynecology and Obstetrics, Pulmonary Medicine, Pediatrics, Dermatology, and Psychiatry. These departments were chosen to provide a comprehensive overview of prescribing practices across various medical specialties, ensuring a diverse and representative sample of prescriptions.

Study duration

The study period was 1 month (May 25, 2024–June 24, 2024), which provided sufficient time to collect a large and representative sample of prescriptions while also allowing for the analysis of prescribing patterns over a continuous timeframe. This duration was selected to balance the need for timely data collection with the practical constraints of conducting an extensive audit.

Inclusion criteria

Participants included patients of all ages and genders attending the specified OPDs during the study period. Only prescriptions containing at least one drug were included in the study. In addition, all participants were required to provide written informed consent to be part of the study. This ensured that the data collected were both relevant and ethically obtained.

Exclusion criteria

Prescriptions from outside the study period, those that did not contain any drugs, and patients who were unwilling to provide written informed consent were excluded from the study. These criteria helped maintain the focus on current and relevant prescribing practices while respecting patient autonomy and ethical standards.

Study sampling

Prescriptions were selected through simple random sampling from each department. This method ensured that every prescription had an equal chance of being included in the study, thus minimizing selection bias and enhancing the representativeness of the sample. Random sampling was essential for obtaining unbiased data that accurately reflected the prescribing habits across different departments.

Study sample size

Based on the WHO recommendations, at least, 600 prescriptions were required to achieve statistically significant results. Prescriptions were distributed equally across the 8 departments, with 75 prescriptions collected from each. Over a 26-day period (excluding Sundays), each department contributed approximately three prescriptions daily. This sample size was determined to ensure adequate power to detect prescribing errors and assess rationality.

Study groups

This study did not involve specific study groups as it aimed to audit prescriptions across various departments without subgroup analysis. The focus was on overall prescribing practices rather than comparisons between distinct groups of patients or prescribers.

Study parameters

The study parameters included the frequency and types of prescribing errors, and the rationality of the prescribed treatments. These parameters were chosen to provide a comprehensive assessment of prescription quality, including both technical accuracy and clinical appropriateness.

Study procedure

Data were collected using structured pro forma as per the National Health Mission Prescription Audit Guidelines 2021 [18]. This standardized approach ensured consistency in data collection across all departments. Prescriptions were reviewed for completeness, accuracy, and rationality, with any errors or issues documented for further analysis. The structured pro forma included fields for patient demographics, prescription details, and specific criteria for evaluating prescribing practices.

Study data collection

Data collection involved review of prescriptions from the selected departments. Each prescription was examined for adherence to rational prescribing principles, including appropriate drug choice, correct dosage, and suitable duration of treatment. Data were recorded in a standardized format to facilitate accurate and consistent analysis.

Data analysis

Data obtained from the study were entered into Microsoft Excel 2021 and analyzed using appropriate statistical methods. The analysis focused on identifying the frequency and types of prescribing errors, evaluating the rationality of treatments, and identifying patterns or trends in prescribing practices. Statistical techniques were employed to ensure the robustness and reliability of the findings.

Ethical considerations

The study was conducted after obtaining written informed consent from the patients. Ethical approval was obtained from the Relevant Institutional Ethics Committee of SMCH (vide no. SMC/ETHICS/M1/2024/22, dated: May 20, 2024). The study adhered to ethical guidelines for research involving human participants, ensuring that patient confidentiality was maintained and that the data collection process did not interfere with patient care.

RESULTS

The prescription audit at SMCH involved collecting a total of 600 prescriptions from various outpatient departments (OPDs). The distribution of prescriptions across the departments is as follows (Table 1).

Table 1 and Fig. 1 illustrates that an equal number of 75 prescriptions (12.5%) were collected from each of the eight departments to ensure a balanced and representative sample for the audit. Table 2 shows the different criteria of prescription audit and the results obtained after the evaluation of these criteria.

Table 1: Department Distribution of Prescriptions. (This table illustrates that an equal number of 75 prescriptions were collected from each of the eight departments to ensure a balanced and representative sample for the audit)

Department	Total prescriptions collected	Percentage
General Medicine	75	12.5
Surgery	75	12.5
Orthopedics	75	12.5
Gynecology and Obstetrics	75	12.5
Pulmonary Medicine	75	12.5
Pediatrics	75	12.5
Dermatology	75	12.5
Psychiatry	75	12.5
Total	600	100

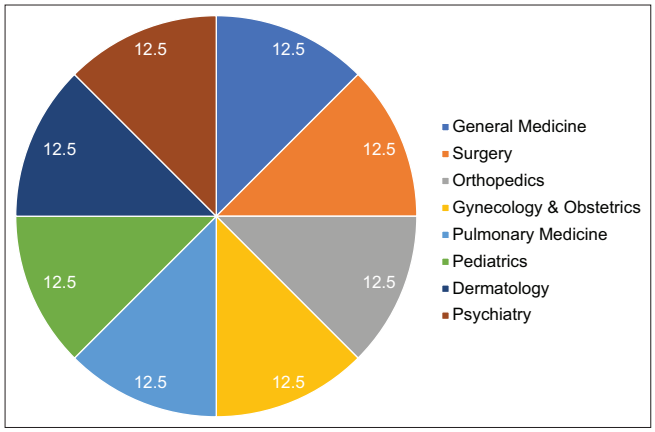

Fig. 1: Department distribution of prescriptions (n=600)

DISCUSSION

The prescription audit conducted at SMCH has provided a wealth of data regarding current prescribing practices across various OPDs. The audit, which examined 600 prescriptions from eight different departments, aimed to assess the rationality of prescribing, adherence to guidelines, and areas requiring improvement. The findings offer valuable insights into the strengths and weaknesses of the current system, as well as recommendations for enhancing patient care and medication safety.

Compliance with essential prescription criteria

One of the standout results from the audit is the high level of compliance with several essential prescription criteria. For instance, the OPD registration number, date of consultation, and patient gender were consistently recorded in all prescriptions (100%). This reflects a robust adherence to basic administrative practices, which are crucial for ensuring traceability and proper documentation.

However, the study revealed that the complete name of the patient was missing in 1.7% of prescriptions, and the age was not correctly recorded in 3.3% of cases. While these percentages may seem small, they highlight a potential risk in patient identification and the tailoring of treatments based on age-specific considerations. Ensuring that every prescription includes this basic yet critical information is essential for optimizing patient care.

Handwriting and legibility

The audit found that the handwriting on 24.3% of prescriptions was not legible. This is a significant concern, as illegible handwriting can lead to misunderstandings in medication administration, potentially causing medication errors. The implementation of electronic prescribing systems (e-prescribing) could mitigate this issue by ensuring that all prescriptions are clear and readable, thereby reducing the risk of errors due to poor handwriting.

Clinical documentation and diagnosis

The study also highlighted gaps in clinical documentation. For instance, only 66.9% of prescriptions included a record of the salient features of the clinical examination, and just 69.1% mentioned a presumptive or definitive diagnosis. These omissions are concerning, as they suggest that nearly one-third of the prescriptions may lack sufficient clinical context to justify the prescribed medications. Proper documentation of clinical findings and diagnoses is vital for ensuring that prescriptions are based on sound clinical judgment and are aligned with the patient's condition.

Generic prescribing and adherence to standard treatment guidelines (STG)

A positive finding from the audit was that 85.3% of medicines were prescribed by their generic names. This aligns with the principles of rational drug use, promoting cost-effective treatment options for patients. However, adherence to STG was observed in only 75% of prescriptions. This indicates that a quarter of the prescriptions deviated from established guidelines, which could potentially compromise the quality of care. Strengthening adherence to STGs through CME and audits could help standardize prescribing practices and improve patient outcomes.

Duration of treatment and follow-up advice

The duration of treatment was mentioned in 97.5% of prescriptions, indicating a high level of compliance in this area. However, follow-up advice and precautions were recorded in only 16.9% of prescriptions. This is a critical gap, as patients rely on clear instructions regarding follow-up care to manage their conditions effectively. Enhancing communication between healthcare providers and patients through detailed follow-up advice can improve treatment adherence and reduce the likelihood of complications.

Antibiotic prescribing and antimicrobial stewardship

The audit revealed that antibiotics were prescribed in 41.4% of the cases, but there was a deficiency of facility's Antibiotic Policy. This is a significant finding, given the global concern over AMR. The overuse and misuse of antibiotics are key drivers of AMR, and this study underscores the need for robust antibiotic stewardship programs at SMCH. Regular audits and targeted interventions, such as provider education and stricter enforcement of antibiotic policies, are essential for curbing inappropriate antibiotic use and mitigating the threat of AMR.

Polypharmacy and prescription of multiple medications

Polypharmacy, defined as the concurrent use of multiple medications, was another important aspect of the audit. The data showed that 37.6% of prescriptions included three or more medications, with 11% containing five or more. In our study, 11% of the prescriptions demonstrated polypharmacy, defined as the concurrent use of five or more medications per prescription. This finding is consistent with the WHO definition of polypharmacy, which is highlighted on page 11 of their document on patient safety and universal health coverage. Polypharmacy, while sometimes necessary, increases the risk of ADRs and drug-drug interactions, particularly in patients with multiple comorbidities. Therefore, regular prescription audits and efforts to deprescribe unnecessary medications are crucial for minimizing these risks and optimizing patient care [19]. While polypharmacy may be necessary in patients with multiple comorbidities, it also increases the risk of ADRs, drug-drug interactions, and medication non-adherence. The audit highlights the importance of reviewing prescriptions to ensure that each medication is necessary and to consider deprescribing where appropriate. Studies have shown that reducing unnecessary polypharmacy can improve patient outcomes without compromising care.

Availability of prescribed medications

A notable finding was that only 41.7% of the prescribed medicines were available in the hospital dispensary. This gap between prescribing and availability can lead to treatment delays and increased out-of-pocket

Table 2: Criteria of prescription audit

Criteria	Yes	Yes (%)	No	No (%)	NA	NA (%)
OPD registration number mentioned?	600	100.0	0	0.0	0	0.0
Complete name of the patient is written?	590	98.3	10	1.7	0	0.0
Age in years written? (≥ 5 in years and in case of<5 years in months)	580	96.7	20	3.3	0	0.0
Date of consultation - day/month/year	600	100.0	0	0.0	0	0.0
Gender of the patient	600	100.0	0	0.0	0	0.0
Handwriting is legible in capital letters	454	75.7	146	24.3	0	0.0
Brief history written	476	79.4	124	20.6	0	0.0
Allergy status mentioned	0	0.0	600	100.0	0	0.0
Salient features of Clinical Examination recorded	401	66.9	199	33.1	0	0.0
Presumptive/definitive diagnosis written	415	69.1	185	30.9	0	0.0
Medicines are prescribed by generic names	512	85.3	88	14.7	0	0.0
Medicines prescribed are in line with Standard Treatment Guidelines (STG)	450	75.0	150	25.0	0	0.0
Medicine schedule/doses clearly written	476	79.4	124	20.6	0	0.0
Duration of treatment written	585	97.5	15	2.5	0	0.0
Date of next visit (review) written	450	75.0	150	25.0	0	0.0
In case of referral, relevant clinical details and reason for referral given	13	2.2	13	2.2	574	95.6
Follow-up advice and precautions (do's and don'ts) are recorded	101	16.9	499	83.1	0	0.0
Prescription duly signed (legibly)	234	39.0	366	61.0	0	0.0
Medicines prescribed are as per EML/Formulary	560	93.4	40	6.6	0	0.0
Medicines advised are available in the dispensary	250	41.7	350	58.3	0	0.0
Vitamins, Tonics, or Enzymes prescribed	124	20.6	476	79.4	0	0.0
Antibiotics prescribed	248	41.4	352	58.6	0	0.0
Antibiotics are prescribed as per facility's Antibiotic Policy	0	0.0	0	0.0	600	100.0
Investigations advised	278	46.3	322	53.7	0	0.0
Injections prescribed	35	5.9	565	94.1	0	0.0

Number of medicines prescribed (1590 medicines prescribed in total)	Number of prescriptions	Total number of medicines
1 medicine/prescription	145	1×145=145
2 medicines/prescription	229	2×229=458
3 medicines/prescription	106	3×106=318
4 medicines/prescription	54	4×54=216
5 medicines/prescription	49	5×49=345
6 medicines/prescription	11	6×11=66
7 medicines/prescription	6	7×6 = 42

expenses for patients. To address this issue, there needs to be better coordination between prescribers and the pharmacy department to ensure that prescribed medications are readily available. In addition, promoting the use of essential medicines that are consistently stocked can help reduce the disparity between prescription and availability.

ADRs and safety concerns

The audit did not directly assess ADRs, but the lack of documentation regarding allergy status in 100% of prescriptions is a safety concern. Failure to record allergy status can lead to the prescription of medications that may cause allergic reactions, putting patients at risk. Implementing mandatory fields for allergy information in both paper and electronic prescriptions can help mitigate this risk and enhance patient safety.

Recommendations for improvement

Based on the audit findings, several recommendations can be made to improve prescribing practices at SMCH. First, there should be a concerted effort to improve clinical documentation, particularly in recording diagnoses, clinical findings, and follow-up advice. Second, the adoption of e-prescribing systems should be prioritized to reduce errors related to handwriting and enhance the accuracy of prescriptions. Third, regular CME programs focusing on rational prescribing, antibiotic stewardship, and adherence to STGs should be conducted to reinforce best practices among healthcare providers.

In addition, there should be greater collaboration between prescribers and pharmacists to ensure that the prescribed medications are available in the dispensary. Finally, regular audits should be institutionalized as a continuous quality improvement measure, with feedback provided to prescribers to encourage adherence to guidelines and improve patient care.

Limitations

The research was done at an single facility, hence limiting the generalizability of the results to a larger sample size. The authors also acknowledge additional significant constraints, such as the study's brief duration and the research's cross-sectional methodology. The findings may lack generalizability to other contexts due to the research being conducted exclusively at a tertiary care center.

CONCLUSION

The prescription audit at SMCH has highlighted both strengths and areas for improvement in current prescribing practices. While there is a commendable level of compliance with several essential criteria, gaps in clinical documentation, follow-up advice, and antibiotic stewardship need to be addressed. By implementing the recommended improvements, SMCH can enhance the quality of healthcare delivery, reduce the risk of medication errors, and promote the rational use of medicines. Continuous education, regular audits, and the integration of technology will be key to achieving these goals and ensuring that patients receive the highest standard of care.

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AUTHORS' CONTRIBUTIONS

Pranab Das, Nilanjan Biswas, and Nivedita Saha: One of the researchers who devised the study concept and research topic. In addition, they were engaged in various aspects of the study, including designing the

research, determining the intellectual content, doing literature searches, collecting, and analyzing data. Furthermore, they were responsible for creating and editing the manuscript, as well as reviewing it. Rohit Tigga: One of the creators of the study's premise. Furthermore, he made significant contributions to the study by participating in the design, defining the intellectual aspects, doing literature searches, collecting data, creating and revising the paper, and overseeing all stages of the research process. Arunima Singha and Aritra Gupta: One of the authors who developed the framework for the study was also responsible for data collection, literature search, study design, defining intellectual content, collecting data, and producing the manuscript.

CONFLICTS OF INTEREST

The authors have disclosed no known or prospective conflicts of interest.

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