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A DRUG UTILIZATION EVALUATION STUDY IN TERTIARY CARE HOSPITAL, SILVASSA- AN OBSERVATIONAL STUDY

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ABSTRACT

Background: Drug utilization studies identify inappropriate use (overuse, underuse, polypharmacy, brand name prescribing) and their clinical, economic, and public health consequences, including antimicrobial resistance.
Objective: To describe drug utilization patterns in medicine wards of a tertiary care hospital and assess concordance with WHO core prescribing indicators.
Material and Methods: Prospective cross sectional study at NAMO Hospital, Silvassa (Oct 2022–Mar 2023). Consecutive patients (n=150) were enrolled. Prescriptions were evaluated using WHO indicators: average drugs per encounter; % prescribed by generic name; % encounters with an antibiotic; % encounters with an injection; and % drugs from the WHO Model List of Essential Medicines. Demographic, clinical, and prescription data were abstracted from medical records. Descriptive statistics (percentages, mean ± SD) were computed in Excel.
Results: Of 150 patients, 125 (83.3%) were male. Prescriptions clustered in the 31–60 year age group. The most frequently prescribed classes were antimicrobials (93.3%), gastrointestinal agents (92.6%), vitamins (78.6%), and analgesics (74.0%). Adherence to the EDL was ≈90.4%. Comparison with WHO reference values revealed polypharmacy and markedly elevated antibiotic and injection use, with suboptimal generic prescribing.
Conclusion: High antimicrobial use and polypharmacy with incomplete generic prescribing and near optimal EDL adherence were observed. Strengthening antimicrobial stewardship, routine WHO indicator audits, and targeted prescriber training are recommended to promote rational drug use and reduce resistance.

Keywords: *Analgesic, Cross sectional, Drug utilization. Injection.*

INTRODUCTION

The World Health Organisation (WHO) defined drug utilization as the sale, usage, and prescription of medications in a society while taking into account any potential medical, social, or economic repercussions. [(1)] The factors that affect the prescribing, dispensing, administering, and taking of medication, as well as the events connected to it, are the focus of studies on the process of drug utilization. These studies cover the medical and non-medical determinants of drug utilization, the effects of drug utilization, as well as studies on how drug utilization relates to the effects of drug use, whether they be positive or negative. [(1)]

The overuse or underuse of medications, high drug costs, the indiscriminate and repetitive use of injections and antibiotics, the use of multiple medications, the use of brand names rather than generic names when prescribing, and the non-prescribing of medications that might not agree with nor comply with standard guidelines or from EDL are all inappropriate uses of medications. Ineffective treatment, the emergence of antimicrobial resistance (AMR), negative effects, and a financial burden on patients and society are the results of this. [(2,3)]

The major goal of drug utilization research is to encourage organizations to use medications wisely. The logical use of a medication for a specific patient necessitates the recommendation of an effective medication at the recommended dosage. [4] To improve therapeutic effectiveness, reduce side effects, and provide feedback to prescribers to ensure rational use of medicines, periodic monitoring of prescription and drug utilization patterns should be conducted. [5] This study included estimates of the number of patients exposed to drugs within a given period.

The WHO stated that rational use of the drugs requires that patients receive medications appropriate to their clinical needs in doses that meet their requirements for an adequate period and at the lowest cost to them and the community. [6] The percentage of encounters with injections, the average number of pharmaceuticals given by generic name, and the proportion of drugs recommended from the essential drug list are among the WHO's primary indicators for drug use. [7] Inappropriate drug utilization refers to the administration and distribution of pharmaceuticals under conditions that diminish their therapeutic efficacy or substantially reduce the likelihood of achieving the intended pharmacological outcome.[8] Irrational prescribing practices contribute to unsafe and suboptimal therapeutic interventions, representing a significant challenge in contemporary medical practice. [9,10,11]

The objective of this study is to record the drug utilization pattern and analyse the drug using WHO (World Health Organization) indicators & how much it conforms to standard treatment guidelines in different wards of tertiary care hospital.

MATERIAL AND METHODS

Study Design, Study Setting, and Study Population - We conducted a Prospective cross-sectional Drug Utilization Study at the medicine Department of NAMO Hospital, Silvassa, India, over six months i.e. from October 2022 to March 2023. Our hospital is a top-tier tertiary care facility that serves a sizable patient base from urban and rural areas. The medicine department has more than fifty Beds and has a turnover of about three thousand patients per month. Patients presenting with emergency medical conditions were initially managed by resident physicians and the attending physician on duty. Subsequent definitive care and continuation of treatment were undertaken under the supervision of the unit-in-charge physician.

The WHO prescribing indicators were used in this study. Indicators were- The average number of drugs prescribed per encounter, Percentage of drugs prescribed by generic name, Percentage of encounters in which an antibiotic is prescribed, Percentage of encounters with an injection prescribed, Percentage of drugs prescribed from WHO Model List of Essential Medicines (EML).

Data Collection- For studying the drug utilization pattern, the following data were collected-(i) age, (ii) gender, (iii) average stay in the emergency department, (iv) diagnosis of the patient, and (v) comorbid conditions. Detailed information on drugs used including the name of the drug, dosage schedule (form, route, and frequency), and duration of treatment was recorded from the patient's medical records. For the cost assessment, we only considered the medications that were provided in the medicine department for the patient's acute condition.

Statistical Analysis- Descriptive statistics were applied to the collected data using Microsoft Excel Software. Results are expressed in percentage and mean-standard deviation (SD).

RESULT

Out of 150 patients included in the study, 25 (16.6%) were female & 125 (83.3%) were males. Fig 1 shows the age distribution of study participants. The age group range from 2 to 75 yrs & above.
As shown in Fig. the total number of patients were 150 out of which patient with high number of prescribed drugs were in age group between 31-45 (47%) & second age group was between 46-60 (44%) who were widely exposed

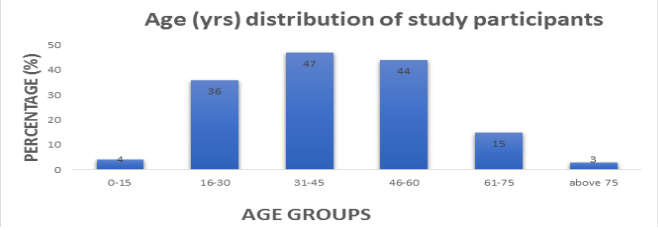

Figure 1- Age distribution of study participants

Gender Distribution

In this prospective study, 150 of the 204 patients admitted to the general medicine ward were prescribed antibiotics during the study period. Out of total 150 patients, 125 (83.3%) were male & 25 (16.6%) were female.

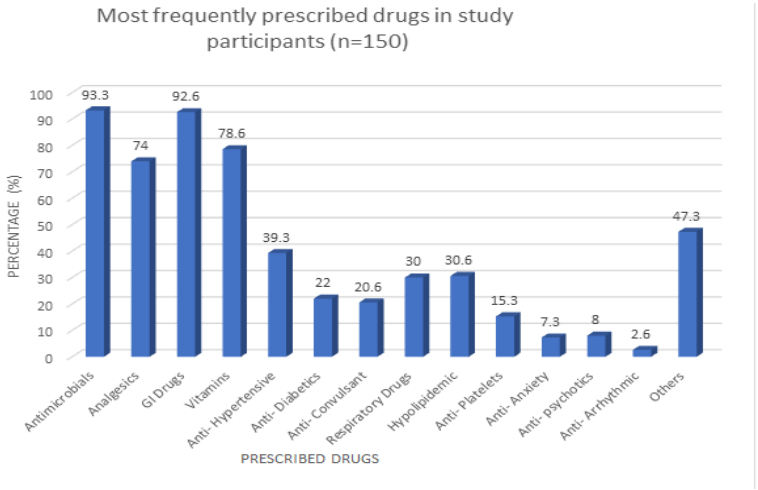

Figure 2- Most Frequently Prescribed Drugs

Fig 2 shows different percentage of most frequently prescribed drugs. The highest prescribed drug were antimicrobials which is (93.3%), GI drugs (92.6%), Vitamins (78.6%), Analgesics (74%), others were (47%), anti-hypertensive was (39.3%) Hypolipidemic was (30.6%), respiratory drugs were (30%), Anti-diabetics were (22%), Anti-convulsant were (20.6%), Anti-platelets were (15.3%), Anti-psychotics were (8%), Anti-anxiety were (7.3%), Anti-arrhythmic were (2.6%).

WHO INDICATORS- Prescription was analysed using WHO indicators to explain the current trend of prescribing pattern and drug utilization in the hospital (Table 1)

Table 1: WHO core drug prescribing indicators used to assess study prescription (n =150)

Sr. No	WHO indicators	Standard value	Study value
1	Average number of drugs per prescription	1.60-1.80	9.45
2	Percentage of drugs prescribed by generic name (%)	100	80.85
3	Percentage of encounter with an antibiotic prescribed (%)	20-26.80	96.67
4	Percentage of encounters with an injection prescribed (%)	13.40-24.10	98
5	Percentage of drugs prescribed from essential drug list (%)	100	90.42

DISCUSSION

Inappropriate prescribing, dispensing, and administration of medicines remain major contributors to irrational drug use and its downstream consequences, including adverse drug reactions, therapeutic failure, and antimicrobial resistance; global surveillance data and WHO analyses continue to highlight excessive and inappropriate antibiotic use as a principal driver of resistance. [12]

Drug utilization studies are a validated method to quantify prescribing patterns, identify targets for intervention, and monitor the impact of stewardship activities; such evaluations have been used successfully in intensive care and outpatient settings to benchmark practice against WHO/INRUD indicators and to guide corrective measures. [13]

In the present prospective cross-sectional study at NAMO Hospital (n = 150), we observed a marked predominance of male patients (83.3%) and a concentration of prescriptions in the 31–60 year age range, with the highest exposure in the 31–45-year group. The prescribing profile was dominated by antimicrobials (93.3%), gastrointestinal agents (92.6%), vitamins (78.6%), and analgesics (74.0%), consistent with patterns reported in comparable institutional audits where antimicrobials and symptomatic therapies predominate. [1,5,7]

Evaluation against WHO core prescribing indicators revealed substantial deviations from recommended standards: the average number of drugs per encounter and the proportion of encounters with antibiotics or injections were markedly higher than WHO reference values, while generic prescribing and essential drug list (EDL) adherence were suboptimal though substantial (EDL use ≈ 90.4%). These findings indicate a combination of polypharmacy and high empirical antibiotic use, both of which increase the risk of adverse events, drug interactions, and selection pressure for resistant organisms. [14]

Taken together, the data support targeted interventions at multiple levels: implementation or strengthening of antimicrobial stewardship programs, prescriber education and feedback, routine prescription audits using WHO indicators, and institutional policies to promote generic prescribing and adherence to the EDL. Such measures have been

shown in the literature to reduce inappropriate antibiotic use and improve prescribing quality when combined with regular monitoring and clinician engagement. [15,16,17]

CONCLUSION

The study demonstrates a high prevalence of antimicrobial and polypharmacy prescribing in the medicine wards of a tertiary care hospital, with partial adherence to the WHO essential drug list and suboptimal generic prescribing; these patterns warrant urgent stewardship and educational interventions. Implementation of regular prescription audits using WHO indicators, combined with focused antimicrobial stewardship and prescriber training, is recommended to improve rational drug use and reduce the risk of antimicrobial resistance.

DECLARATION

Conflict of interest: No! Conflict of interest is found elsewhere considering this work.
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