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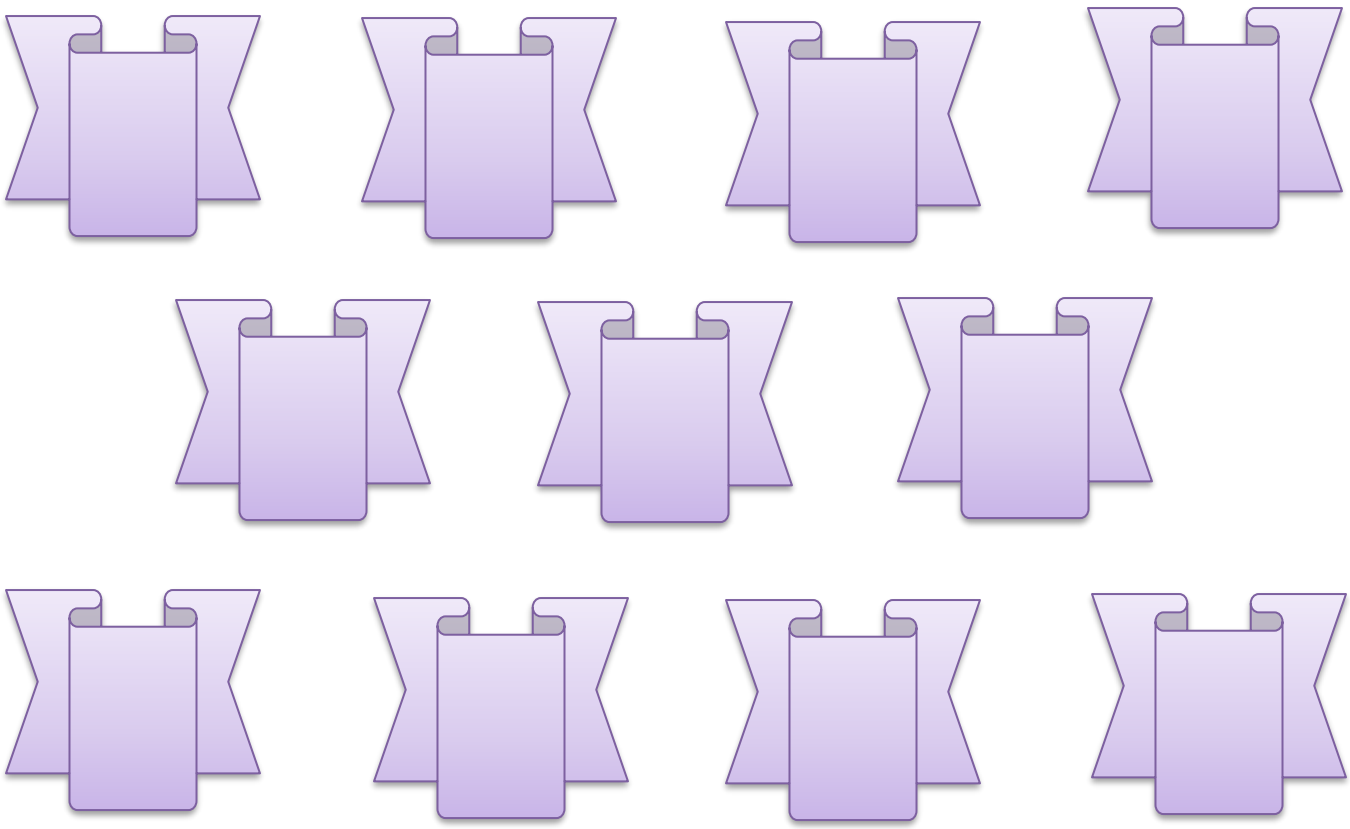

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Original Article

Drug Prescription Pattern of Inpatients in a Tertiary Care Hospital - A Prospective Observational Study

Brahadeesh M *[1], Tiruvalavan SR [2]

[1] Department of Pharmacology, Government Medical College, Virudhunagar, Tamil Nadu, India
[2] Department of Pharmacology, Sri Venkateswaraa Medical College Hospital and Research Centre, Puducherry, India

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*Corresponding author

Email: drbrahadeesh7@gmail.com

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ABSTRACT

Background and Objective: The World Health Organization [WHO] supports the use of drug use prescribing indicators as important tools for evaluating the level of polypharmacy, the use of generic medications, and the appropriateness of the use of antibiotics or parenteral medications in addition to gauging adherence to the list of essential drugs.

Patients and Methods: Our study was done prospectively from inpatients admitted in our tertiary care hospital. Prescriptions were randomly chosen to be analysed for the WHO prescribing indicators for a period of 6 months from April 2023 to September 2023.

Results: A total of 600 prescriptions were analysed and the average number of drugs per prescription was 3.28. The demographic distribution of patients mirrored a rising trend with increasing age as a higher proportion of patients [345] were 60 years and above [57.5%]. Among the rest, those aged 40 years and above were 29.3% [176] and 13.2% [79] were <40 years. 558 [93%] prescriptions did not have any generic names, 81.40% prescriptions did not have any antibiotics and likewise 92.50% did not have any injections prescribed. 1968 drug products prescribed, the highest percentage [12%] of prescribed drugs were antidiabetic, anti-hypertensives, antiplatelets and hypolipidemics.

Conclusion: Hence our study has identified the need for necessary adjustments to the prevalent prescribing patterns in tertiary care hospitals.

Keywords: Prescribing indicators; Rational prescribing; Polypharmacy.

INTRODUCTION

Studies on prescription pattern monitoring instruments are utilized to evaluate the frequency of prescription, dispensing, and distributing pharmaceuticals in a particular location. Such research' major objective is to promote the sensible use of medications [1]. The WHO developed the drug use indicators in cooperation with the international network for rational use of pharmaceuticals in an effort to assess the level of rational prescribing [1, 2]. The indicators for prescriptions, quality of care and patient care are the three categories into which the WHO has separated the basic drug use indicators. These very uniform indications don't require national customization. Despite not measuring all elements of drug use that call for complex methodology, several sources of information, and a range of data sets the main drug use indicators offer a fundamental instrument for the rapid and accurate evaluation of several crucial elements of health care.

Evaluating drug prescription patterns is an essential component of patient care and a way to assess the quality of care provided. According to a recent thorough investigation, prescription quality is a component that needs constant monitoring [3].

Reasonable drug use is necessary for a health care system to operate efficiently and effectively. However, the reason why irrational medication usage is more prevalent in developing countries is because of the world-wide hazard posed by irrational pharmaceutical prescribing, dispensing, and administration [4]. It is immoral to prescribe drugs irrationally, as this significantly lowers the bar for drug therapy. It also poses serious health risks, such as an increase in the likelihood of side effects, drug interactions, and the establishment of drug resistance, particularly when used in conjunction with antimicrobial therapy [5]. Nearly half of all medications are prescribed, dispensed, and marketed improperly, according to the World Health Organization [WHO] [6].

Within a certain administrative or geographic area, drug use indicators are routinely observed in order to record drug usage at a specific point in time or to track changes over time. To analyse the change in performance, these variables are measured often over time or collected through a cross-sectional survey. The WHO indicators could be helpful in determining the number of prescriptions that are generic and the degree of polypharmacy, and the appropriateness of utilizing antibiotics and parenteral drugs, in addition to monitoring adherence to the list of essential pharmaceuticals [7].

The aim of this study was to evaluate the drug prescribing patterns among the medical inpatients of our tertiary care hospital using the five WHO prescribing indicators, which include the average number of drugs per patient encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, and percentage of drugs prescribed from essential drugs list or formulary.

PATIENTS AND METHODS

A cross-sectional study was carried out among our tertiary care hospital's inpatients after getting approval from the Institutional Ethics Committee.

We chose a sample size of 600 patients based on the WHO recommendation that there be at least 600 patient encounters. This study was done prospectively from the inpatients admitted in our hospital after getting a written informed consent. Over the course of six months from April 2023 to September 2023, prescriptions were selected at random for analysis in relation to the WHO prescribing indicators. Our team included a well-trained clinical pharmacist to collect data on prescribing indicators.

Every prescription was treated as a single patient encounter for the purposes of calculating the necessary parameters. Regardless of comorbidities, prescriptions for patients who were admitted to our hospital were included. Demographic data were collected, which included the patient's age, gender, diagnosis, and the suggested treatment plan, all of which were specified in the prescription. The WHO's standard criteria were used when analysing the prescription indicators [2].

[1]. Average number of drugs per encounter: Average was calculated by dividing the total number of different drug products prescribed, by the number of encounters surveyed. Whether the patient actually received the drugs was not considered relevant in calculating this indicator.

[2]. Percentage of drugs prescribed by generic name: percentage was calculated by dividing the number of drugs prescribed by generic name, by the total number of drugs prescribed and expressed as a percentage.

[3]. Percentage of encounters with an antibiotic prescribed: Percentage was calculated by dividing the number of patient encounters during which an antibiotic was prescribed, by the total number of encounters surveyed and expressed as a percentage.

[4]. Percentage of encounters with an injection prescribed: percentage was calculated by dividing the number of patient encounters during which an injection was prescribed, by the total number of encounters surveyed, multiplied by 100.

[5]. Percentage of drugs prescribed from essential drugs list or formulary: percentage was calculated by dividing the number of products prescribed which were on the essential drugs list or local formulary, by the total number of products prescribed and multiplied by 100.

RESULTS

To evaluate the prescribing indicators, the data were imported into Microsoft Excel and examined as frequency distributions and percentages. Over a six-month period, 600 prescriptions in total were examined. As more patients [345] were 60 years of age or older [57.5%], the patients' demographic distribution revealed an increasing trend, as people aged. The remainder included 29.3% [176] people over the age of 40 and 13.2% [79] people under 40. With 307 men and 293 females, the proportion of males and females was practically equal.

There were several and different diagnoses. Consequently, when diseases were classified as communicable and non-communicable, it became clear that the majority [70.1%] Had non-communicable ailments as compared to those with communicable conditions [29.9%]. In the 600 patient contacts, a total of 1968 drug items were found to have been prescribed; as a result, the average number of pills per prescription was 3.28. Overall, the research revealed that this indicator's value exceeded that of the reference standard **[Table 1]**.

Examination of the patient encounters without the required information for the pertinent variables showed that only in 12 patient encounters, at least one medication from the list of necessary medications was lacking compared to 558 [93%] prescriptions without any generic names. It was clear that 81.40% of prescriptions did not include any antibiotics, and 92.50% of prescriptions did not include any injections. The highest percentage [12%] of prescribed drugs among the 1968 drug products were anti-diabetics, anti-hypertensives, antiplatelets, and hypolipidemics, while the total proportion of antibiotics prescribed [112] was only 18.66%, and thus lower than the former drug groups.

There were 261 prescriptions with predetermined medication combinations, or 43.5% of all prescriptions. For pain management, analgesic combinations [tramadol and paracetamol, then ibuprofen and paracetamol] were most frequently given. In the case of prescriptions that contained multiple medications for the same indication, a comparable figure of 29% [174 out of 600] was achieved. Intriguingly, analysis of prescriptions revealed that patient encounters with two medications [25%] were comparable to those with three drugs [26%] representing a total of 51% of prescriptions which fall within one of these two categories. For prescriptions containing four medications as part of the treatment regimen, an identically high percentage [20%] was also noted **[Figure 1]**.

This study found that just 7% of prescriptions were for generic drugs, demonstrating that clinicians' existing prescribing practices favoured brand-name drugs over generic ones. Only 112 [18.66%] of patient contacts resulted in the prescription of an antibiotic. Amoxicillin-clavulanate was the most often prescribed antibiotic, followed by cefixime, cefpodoxime proxetil, and azithromycin. Numerous respiratory diseases, including pharyngitis, sinusitis, and pneumonia, were discovered to be the most frequent reason for the usage of antibiotics. A prescription for an injection was given in about 7.68% of patient encounters, and the essential drug list was observed to be followed in 92.16% of cases.

Table [1]: Comparison of the World Health Organization prescribing indicators observed with standard reference range

Indicator	Number	Average/ percentage [SD]	Standard reference range/optimal value
Average number of drugs per patient encounter	1968	3.28	1.6-1.8
Percentage drugs prescribed by generic names	42	7%	100%
Percentage patient encounters with an antibiotic	112	18.66%	20.0%-26.8%
Percentage patient encounters with an injection	45	7.50%	13.4%-24.1%
Percentage drugs from essential drugs list	553	92.16	100%

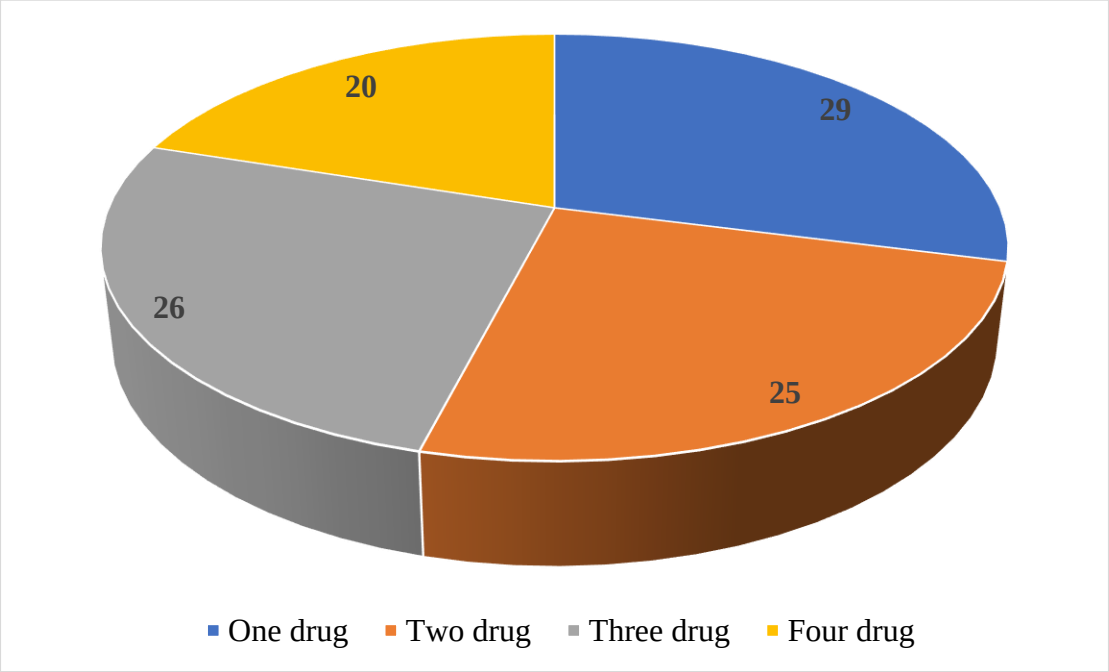

Figure [1]: Percentage distribution of number of drugs in the prescriptions

DISCUSSION

It is well acknowledged that the prescription practices indicators in a number of critical areas related to the acceptable use of pharmaceuticals serve as a benchmark for measuring the performance of healthcare professionals. In our study, the indicators were evaluated using a sample of 600 hospital inpatients. According to information obtained prospectively looking at the prescriptions, the typical number of drugs given for every patient visit at our teaching hospital was 3.28. The measured average was found to be significantly greater than the reference range of 1.6-1.8, which is thought to be the appropriate range, but it was in contrast to the WHO-recommended guideline range for this indication, which calculates the degree of polypharmacy [4]. In addition to using a combination of several pharmaceuticals for a single indication during a patient encounter, a large percentage of fixed drug combinations are also prescribed, which is indicative of this. A comparable study conducted in Goa [8] indicated that on average, 1.8 medications were prescribed, which is less than our data. Our conclusion was greater than that found in earlier Indian studies on prescribing indicators by **Upadhyay *et al.*** [3.76] and **Raj *et al.*** [4.98] [9, 10]. Contrarily, comparable research on drug usage patterns in other nations, including Sudan [1.4], Zimbabwe [1.3], and Ethiopia [1.9] [11], has demonstrated that our study's estimate of the average number of substances per encounter was greater.

The high average number of pharmaceutical products per prescription, which is over the WHO recommended range, is evidence of the widespread polypharmacy in the study area. The trend in the epidemiology of non-communicable diseases like dyslipidemia, diabetes, hypertension, and coronary heart disease, which are frequently coexistent and necessitate treating several disease entities concurrently in same patient, could be attributed to this change [12]. Concurrent presentation of such cardiometabolic illnesses in a single patient necessitates the prescription of many medications for a specific clinical indication, which is frequently resistant to therapy when multiple diseases are present. This is supported by our study as well, where a large percentage of participants [70.1%] had a diagnosis of a non-communicable condition, with diabetes coming in at the highest rate at 38.2%.

Another explanation for the high rate of polypharmacy is that our country is currently experiencing a demographic change due to an increase in the elderly population [13]. This epidemiological shift also contributes to the persistence of the existing situation. A higher percentage of the elderly population, which made up about 57.5% of the study group, may have contributed to the high polypharmacy. Our study's high prescription rates for supplements are still unwarranted and are the result of two significant reasons that may be responsible for the practice's irrationality. First, there is the influence of the pharmaceutical industry, which actively promotes ancillary items among physicians by offering slanted evidence in favour of the necessity of prescribing such products. Second, patients' false beliefs about the benefits of supplements to their health lead to their influence and desire for such goods in their prescriptions. However, rather than caving into their erroneous beliefs, the best course of action with such patients is to educate them [5].

In our study, 6.42% of medications were prescribed by generic name, which is too low, in contrast to the benchmark that was developed to act as the ideal, which is 100% [2]. **Wang *et al.*** discovered that as a doctor's degree and training experience increased, so did the percentage of medications they recommended with generic names [14]. Furthermore, it has been shown that consultants in high-income countries have different perspectives than those in low- and middle-income countries [15].

The pharmaceutical industry's persistent and persuasive promotion of proprietary products may be the main factor in the low percentage of generic prescriptions, and in some cases, clinicians are compelled to give in to wealthy patients' demands for innovative drugs [16]. Another possible explanation for this is that some prescribing doctors are thought to believe that the bioavailability variations between brand-name and generic medications may have a negative impact on the therapeutic results [17]. Such biases may have a negative impact on the tendency to prescribe generic medications. The role that industries have had in discouraging the use of generic medications by providing financial incentives to prescribers cannot be underrated [18]. According to published evidence, public hospitals provide superior generic prescribing than those in the private sector [16].

Intriguingly, we discovered that the percentage of antibiotic prescriptions [18.66%] and injection encounters [7.50%] were both low, pointing to a favourable trend toward a decline in the indiscriminate use of antibiotics and unneeded injections. In our tertiary care institution, both of these variables have an apparent logical prescription trend. Because of the varied incidence rates of infections at different times of the year, our study's 6-month duration prevented it from fully capturing the seasonal change in antibiotic prescription patterns. About 92.16 percent of the medications administered are on the WHO list of essential pharmaceuticals, which is lower than the results of studies conducted in India [99.6], Tanzania [96%], and South Ethiopia [96.6%], but higher than those in Nepal [88%]. The lack of laws requiring the prescription of just medications on the essential pharmaceuticals list and the lack of prescriber sensitization could be to blame for this. Similar to generic prescribing, it has been shown that this indicator varies between the public and private sectors [18]. This indicates that the practice of prescribing from the list of essential pharmaceuticals should be more frequently used, especially in private sector hospitals.

Our study's major limitation is that it was conducted in a single-center tertiary care hospital with a limited sample size of 600. As a result, the findings cannot be extended to other locations, such as public or government hospitals and healthcare facilities, that lack comparable characteristics.

Conclusion: Our analysis of the prescription indicators has clearly demonstrated that the procedures used to prescribe injections and antibiotics are reasonable and suitable; compliance with the list of necessary medications is excellent, albeit there is room for improvement. The level of polypharmacy is higher than average, nevertheless. Another area that requires significant improvement is the prescribing of generic medications. Therefore, the administrative team must develop suitable steps to decrease polypharmacy and boost clinicians' use of generic prescription drugs.

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