

Prescription Audit using WHO Core Prescribing Indicators in a Tertiary Care Hospital in North India

Neetu Gupta¹, Parag Agrawal², Swagata Datta³, Sanjay Kumar Verma⁴, Akanksha Suman⁵

¹Assistant Professor, Department of Pharmacology, Muzaffarnagar Medical College and Hospital, Muzaffarnagar

²Assistant Professor, Department of Pharmacology, Muzaffarnagar Medical College and Hospital, Muzaffarnagar

³Assistant Professor, Department of Pharmacology, Muzaffarnagar Medical College and Hospital, Muzaffarnagar

⁴Associate Professor, Department of Pharmacology, Muzaffarnagar Medical College and Hospital, Muzaffarnagar

⁵Professor, Department of Pharmacology, Muzaffarnagar Medical College and Hospital, Muzaffarnagar

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Corresponding Author: Dr. Swagata Datta

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Abstract:

Background: The rational use of drug prescribing is scrutinized for the utmost benefit of patient welfare. World Health Organization (WHO) core prescribing indicators are highly standardized tools in reliably assessing the essential aspects of drug utilization pattern. In this study, our aim was to assess the prescription pattern and completeness of prescriptions by using WHO recommended core prescribing indicators.

Materials and Methods: A prospective, cross-sectional study was conducted in OPDs and IPDs of various clinical departments of a tertiary care hospital for a period of 15 days. A total of 563 prescriptions were analyzed based on WHO core prescribing indicators. The data collected were analyzed using SPSS version 21.0 and frequencies and percentages were used to determine each variable.

Results: The WHO core prescribing indicators analysis revealed that average number of drugs per prescription was 4.24. The drugs written by generic name were 22.1%. Out of total 2392 drugs prescribed, 552 (23%) drugs were antibiotics. The drugs prescribed by injectable route were 383 (16%). About 1961 (82%) drugs were prescribed from NLEM (National list of essential medicines).

Conclusion: This study on prescription pattern audit done using WHO core prescribing indicators highlights that prescribing pattern of antibiotics and injection use were in accordance with the WHO standard recommendations. However, drugs prescribed by generic name and drugs prescribed from NLEM were found to be less than WHO optimal value.

Keywords: Prescription Audit, Prescribing Indicators, Prescription Pattern, Irrational Prescribing.

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Introduction

Prescription is a medico-legal document written by a registered medical practitioner for the treatment of the patient which reflects the physician's skill of diagnosis and attitude towards selecting the most appropriate and cost-effective treatment. [1,2] Each prescription should contain all the four elements such as superscription, subscription, inscription and signature with registration number issued by medical council. Superscription comprises of information of doctor (qualification, address, contact details) and patient (name, age, sex, address) as well as date of prescription. Subscription consists of information regarding the prescribed drugs like, dosage form, drug name in capital, it's dose and duration, number of drugs etc.

The directions for the use of drugs are written in inscription. Finally, signature of the registered medical practitioner with their registration number should be included as last element of prescription. [3]

According to World Health Organization (WHO) rational use of medicines requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community. WHO estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly.

The overuse, underuse or misuse of medicines results in wastage of scarce resources and widespread health hazards. [4] WHO established few core indicators to investigate the rational use of drugs like prescribing indicators, patient care indicators and health facility indicators. [5]

Prescription errors are one of the major causes of irrational use of medicines. Irrational prescribing is hazardous and may lead to ineffective treatment, adverse drug reactions, prolongation of disease, distress to the patient, increased costs of medication and decreased patient compliance. [6] Prescription errors are classified as omission errors, commission errors and errors related to drug interactions (DIs). Omission errors are those related to patient information (patient's name, age, gender, weight and diagnosis) and prescriber's information (prescriber's name, address, contact details, qualification, registration and date). Commission errors include errors related to the dose, dosage form, strength, frequency and duration of the treatment. [7]

Prescription audit studies the prescribing pattern in order to monitor, evaluate and if necessary, suggest modifications in the prescribing practices of medical practitioners, so as to make the medical care rational and cost effective. [8]

The present study aimed to evaluate prescription pattern and completeness and compare them against WHO recommended core prescribing indicators.

Materials and Methods

A prospective cross-sectional study was conducted in Department of Pharmacology, Muzaffarnagar Medical College, Uttar Pradesh for a duration of 15 days. The study was done after getting ethical clearance from institutional ethics committee.

Prescriptions from OPD and IPD of various clinical departments of Muzaffarnagar Medical College were collected. Convenient sampling was used to select the prescriptions. 563 prescriptions were taken for our study. The first encounter prescriptions received during study period and prescriptions of patients willing to participate were included in the study. Prescriptions containing no medication, prescriptions written before study period and prescriptions of patients not willing to participate were excluded from the study.

A group of undergraduate medical students having their elective posting in Department of Pharmacology who took prescription audit as their elective topic were divided into 7 groups containing two students in each group. These groups collected prescriptions from OPDs and IPDs of various clinical departments. Informed consent was taken from the patients for participating in the study. Prescriptions received from the patients were

scanned by mobile phone and required data from them were entered in the check-list prepared for this study. The data collected were analyzed using SPSS version 21.0 and frequencies and percentages were used to determine each variable.

The following WHO core prescribing indicators were used in the study for evaluation of the prescriptions [9]:

- Average number of drugs prescribed per encounter = Average calculated by dividing the total number of drugs prescribed by the total number of encounters sampled
- Percentage of drugs prescribed by generic name = (Number of drugs prescribed by generic name/total number of drugs prescribed) x 100
- Percentage of encounters with an antibiotic prescribed = (Number of patient encounters with an antibiotic/ total number of drugs prescribed) x 100
- Percentage of encounters with an injection prescribed = (Number of patient encounters with an injection/ total number of drugs prescribed) x 100
- Percentage of drugs prescribed from NLEM = (Number of drugs prescribed from essential drug list/ total number of drugs prescribed) x 100

The audit of the prescription also included the completeness of prescription based on details of doctors and patients, diagnosis, legibility of prescriptions, use of fixed dose combinations, details of dose and duration of treatment, directions to patients, date, signature and registration no of the doctor.

Results

A total number of 563 prescriptions were collected from various clinical departments. Among the 563 prescriptions, 377 prescriptions were collected from OPDs and 186 from IPDs (Figure 1).

WHO core prescribing indicators analysis revealed that average number of drugs per prescription was 4.24. The drugs written by generic name were 22.1%. Out of total 2392 drugs, 552 (23%) drugs were antibiotics. The drugs prescribed by injectable route were 383 (16%). About 1961 (82%) drugs were prescribed from NLEM (Table 1).

Out of 563 prescriptions, 392 (69.63%) had details of doctors whereas 171 (30.37%) lack doctor details. All the collected prescriptions had patient details (age, sex, address, contact details). Diagnosis was mentioned in 536 (95.21%) prescriptions while it was not mentioned in 27 (4.79%) prescriptions. Out of total prescriptions, 68.16% were legible whereas 31.84% were not legible. Out of total 2392 drugs, about 406 (17%)

drugs were FDCs. It was observed that details of drug dosage were written in 496 (88.09%) prescriptions while in 67 (11.91%) prescriptions it was not written. The duration of treatment was mentioned in 65.19% of prescriptions. Follow-up instructions and non-pharmacological advices were

mentioned in 368 (65.36%) prescriptions. Date and signature of doctors were written in 508 (90.23%) prescriptions whereas majority of prescriptions didn't have registration number of the doctor (Figure 2).

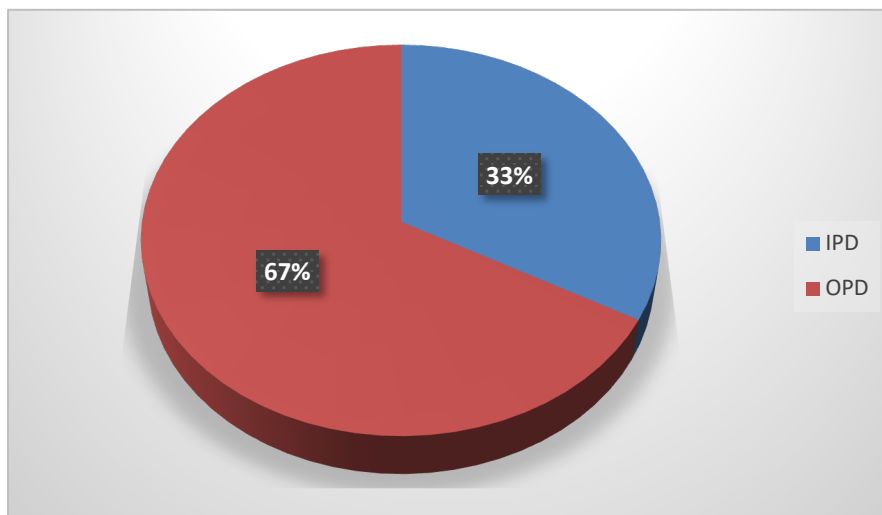


Figure 1: Pie diagram showing percentage of prescriptions collected from IPDs and OPDs

Table 1: Results of world health organization core prescribing indicators (total encounters=563; total drugs=2392)

Core prescribing indicators	Total drugs per encounter	values	Optimal WHO values
Average number of drugs prescribed per encounter	2392	4.24	1.6-1.8
Percentage of drugs prescribed by generic name	529	22.1%	100%
Percentage of encounters with an antibiotic prescribed	552	23%	20.0 - 26.8%
Percentage of encounters with an injection prescribed	383	16%	13.4% -24.1%
Percentage of drugs prescribed from NLEM	1961	82%	100%

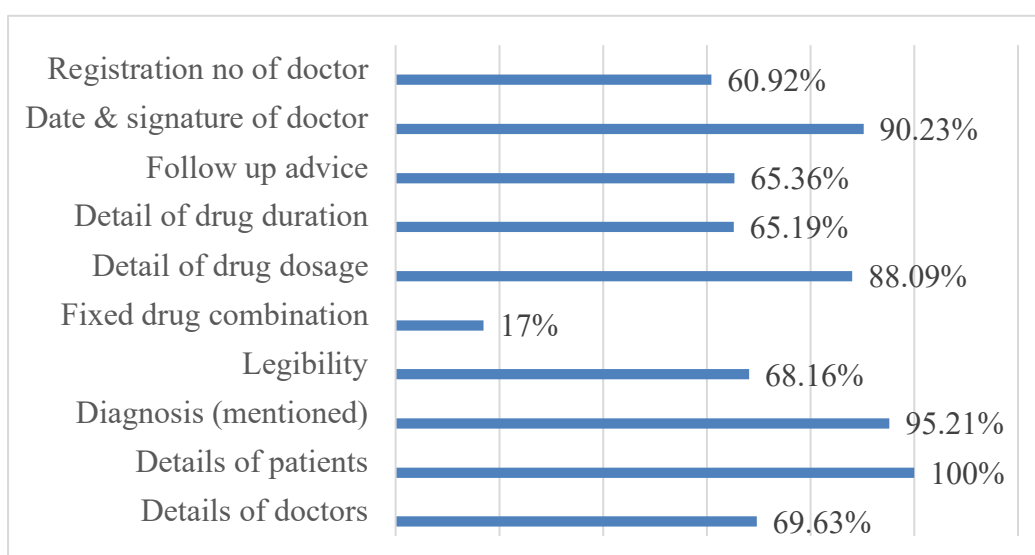


Figure 2: Bar diagram showing results of completeness of the prescriptions

Discussion

A prescription is a written medical instruction given by authorized physician which reflects their

approach towards patient's care and health system. [10]

Based on WHO core prescribing indicators, a total of 563 prescriptions were collected and analyzed. Apart from WHO core prescribing indicators, completeness of prescriptions was also evaluated based on details of doctors and patients, diagnosis, legibility of prescriptions, use of fixed dose combinations, details of dose and duration of treatment, directions to patients, date, signature and registration no of the doctor.

The current study indicated that the average number of drugs per encounter was 4.24 which exceeded the optimal value recommended by WHO which is 1.6-1.8 drugs per encounter. On further evaluation it was observed that most of the patients were suffering from multiple diseases resulting in polypharmacy. However, there is increased risk of developing drug-drug interactions, adverse drug reactions (ADRs) and also increase in treatment cost. [11] In contrast to our study, some studies showed the average number of drugs per encounter was low. [12,13] However, the average number of drugs per encounter was found to be high in some developed as well as in developing countries like Sudan (2.5), Arabia (2.4), UAE (4.9). [14, 15, 16] WHO recommends to prescribe drugs by using generic names to decrease dispensing errors and improve communication among health care professionals. [17] The findings of our study revealed that the percentage of drugs prescribed by generic name was 22.1% whereas the optimal value recommended by WHO is 100%. Our study finding was similar to the studies done by Nyabuti AO *et al* and Pavin M *et al* [14, 18] while in some studies generic prescription was closer to WHO optimal value. [12,13] The variation might be because of extensive drug promotional activity by medical representatives, non-adherence to rational prescribing practices and inadequate prescription audit by the hospital.

According to our study, the percentage of antibiotics prescribed per encounter was 23% which was similar to the optimal range of value of 20.0 to 26.8% recommended by WHO. Our study result was similar to the study done by Meenakshi R *et al*. [19] This might be due to hospital policy on rational use of antibiotics.

In our study, 16% of the prescriptions were comprised of injections which is within the optimal range of 13.4% to 24.1% recommended by WHO. Our study finding was in accordance to another study done in UAE (16.9%). [16] The use of injections should be limited as it may increase the risk of blood borne infections, ADRs. This route is expensive and require expertise compared to oral route. [20]

In our study the percentage of drugs prescribed from NLEM was 82% which was similar to the study done by Meenakshi R *et al* [19] while WHO

recommended optimal value is 100%. Prescribing medicines from NLEM should be promoted to ensure safe and effective use of medicines. [4]

All the prescriptions had complete details of patients such as age, sex, address, hospital registration number which was similar to the study finding done by Siyamala Devi T *et al*. [21] Diagnosis was mentioned in majority of the prescriptions (95.21%) but details of the doctors were present only in 69.63% prescriptions. Out of 563 prescriptions, details of drugs dosage were mentioned in 496 (88.09%) prescriptions which was in contrast to the study done by Potharaju HR *et al* [22] where dosage was mentioned only in 38.8% of the prescriptions. The duration of treatment was mentioned in 65.19% of prescriptions. Most drugs are available in variable strengths and dosage forms causing problems in drugs dispensing. It can also lead to problems such as treatment failure, antibiotic resistance, and adverse drug reactions which are associated with underdosing or overdosing. Wrong dose and wrong duration were the most common types of prescribing errors found in many studies worldwide. [23,24,25] The reasons might be due to heavy OPD load, nonspecific complaints, or verbal communication by doctors, rather than writing in detail.

Out of total prescriptions, only 68.16% were legible. Illegible prescriptions can lead to dispensing and medication errors resulting in serious adverse events and even death. [25] Switching over to electronically generated prescriptions can reduce the rate of medication and dispensing errors compared to handwritten prescriptions. [26] It was observed in our study that 17% drugs prescribed were FDCs which was in accordance to the study done by Meenakshi R *et al*. [19] Potential advantages of FDCs include reduced side effects, increased patient compliance and efficacy and reduced cost. [27] Doctor's registration number was mentioned in only 60.92% of prescriptions. These details are important to identify the prescribing doctor and validate the authenticity of prescriptions.

Limitations: The limitation of our study was that it was done for short period of time because of which our sample size was less. It was done in one tertiary centre, so we cannot generalise the results regarding the prescription behaviour of the physicians. Also, we did not include the prescriptions from intensive care unit.

Conclusion

The study of prescription audit done by using WHO prescribing indicators, the prescribing pattern of antibiotics, and injection use were in accordance with the WHO standard recommendations. However, drugs prescribed by

generic name and prescribed from NLEM were found to be less than WHO optimal value. Regular prescription audit by hospital followed by constructive feedback and continuous medical education on good prescribing habit may ensure good quality of health care facility.

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