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Research Article

DRUG UTILIZATION PATTERN AMONG THE PATIENTS OF LUNG CANCER IN TERTIARY CARE HOSPITAL OF NEPAL

STUTI SHRESTHA*, KEDAR PD. SAH, AJAY KUMAR CHAUDHARY, DIPENDRA DEO THAKUR, RABINDRA MAHARA, SHIV KUMAR SHARMA

Department of Pharmacy, Kantipur Academy of Health Sciences. Kathmandu, Nepal. Email: stuvy.stu@gmail.com

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ABSTRACT

Objective: Lung cancer is one of the most common cancers in the Nepalese population. Due to the advancement of novel drug regimens and chemotherapeutic treatment guidelines, a proper evaluation of prescriptions is mandatory to prevent unnecessary drug use, which may lead to distress and harm on patient's health financially and increases morbidity and mortality. Hence, drug utilization study has become an important criterion to implement during the evaluation of prescription and to study the trends of prescribing by prescribers.

Methods: From March 2023 to August 2023, we included 242 adult patients who had received chemotherapy in Bhaktapur Cancer Hospital. A retrospective cross-sectional study was done to evaluate socio-demographic profile of patients and medicines prescribed using the World Health Organization (WHO) prescribing indicators.

Results: The mean age was 58.21±13.22, with 57% (n=138) of the patients being male. The average number of drugs prescribed was 9.28, and 35.95% of the prescription was with antibiotics. Cisplatin (29.34%; n=260) and 5-fluorouracil (14.05; n=34) were among the most frequently prescribed chemotherapeutic agents, and antiulcer drugs (19.23%; n=260) and nutritional supplements (17.6%; n=238) were among the most commonly prescribed adjuvant drugs. 65.49% of the drugs prescribed belonged to the essential drug list, and only 21.228% drugs were prescribed by generic name.

Conclusion: Our study revealed the presence of polypharmacy in lung cancer patients. Prescribing medicines through generic names was found to be low. All WHO prescribing parameters were deviated from the optimal value. Hence, this study suggested that an effective intervention is needed for the rational use of drugs.

Keywords: Core prescribing indicators, Lung cancer, Polypharmacy, Prescribing pattern.

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INTRODUCTION

Cancer is the second leading cause of death, with 18.1 million new cases and 9.6 million deaths in 2018 [1]. Lung cancer is the most common cancer in men (18% of new cases diagnosed) and the third most common cancer in women (7.7%) in Nepal [2]. The World Health Organization (WHO) has defined rational use of drugs as "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period, and at the lowest cost to them and their community [3]. It is estimated that 60% of medicines in primary health care facilities are prescribed inappropriately in developing countries [4]. This problem highlights the importance of proper prescribing by health care professionals. The assessment of drug utilization practice using WHO prescribing indicators is important to promote appropriate prescribing and is important to promote rational use of drugs [5]. Rational use of medicines has a significant role in reducing global morbidity and mortality. It also helps to reduce inappropriate prescribing, events of antibiotic resistance, life-threatening adverse drug reactions, and drug-drug interactions [6,7]. The evaluation of prescriptions provides feedback and suggestions to outline newer guidelines for the standard protocol of efficient therapy for patients [6,7].

A major pharmacological approach for cancer treatment is the utilization of cytotoxic drugs against cancer cells. Due to advanced research about cancer and the discovery of novel drugs against malignancy, the use of these neoplastic agents is predominant [8].

MATERIALS AND METHODS

The study was designed to investigate the trends of prescribing and utilization pattern of chemotherapeutic agents prescribed for lung cancer in Bhaktapur Cancer Hospital. The protocol was approved by the review committee of Kantipur Academy of Health Sciences and Bhaktapur Hospital. Continuous data were expressed as mean±standard deviation, and the nominal data were expressed as frequency and percentages.

Study design

Study design and setting: A single centered non interventional retrospective cross-sectional study was conducted for 6 months from March 2023–August 2023 in the Department of Medical Oncology at Bhaktapur Cancer Hospital, Bhaktapur. Before the initiation of the study, the ethical approval was obtained from the Institutional Ethics Committee of Kantipur Academy of Health Sciences.

Study duration

The duration of the study period was March 2023–August 2023.

Study criteria

Cancer patients of either gender with an age of more than 20 years on chemotherapy, along with supportive care medications, were enrolled during the study period. Patients undergoing concurrent radiotherapy, with insufficient data, and not willing to participate in the study were excluded.

Sample size

A total of 242 patients with lung cancer, older than 20 years, were included in this study.

Methodology

The WHO core drug prescribing indicators were used to determine the percentage of antibiotics and injectable prescribed, the percentage of drugs prescribed from the essential medicine list, and polypharmacy.

Data entry and analysis
Microsoft Office Excel (2007) as well as SPSS version 26 were used for data entry, recording, and analysis.

RESULTS

A total of 242 patients were analyzed during the study. The gender and age distribution is described in Fig. 1 and Table 1.

Of 242 patients, the majority turned out to be male, with a total of 138 (57%). Male: Female ratio was found to be 1.32.

Majority of the patients (36.8%) were in the age group of 61–70 years (36.4%, n=88) followed by 51–60 years (19%, n=46), 71–80 years (18.18%, n=44), 41–50 years (18.28%, n=37), 31–40 years (7.43%, n=18), and 21–30 years (3.71%, n=9).

Functional classification of cytotoxic drugs
A total of 221 chemotherapeutic agents were prescribed, among which cisplatin was most commonly prescribed (29.34%, n=71), followed by 5-Fluorouracil (14.05%, n=34). The data are shown in Table 2.

Out of 1352 adjuvant drugs, antiulcer drugs belonging to the class proton pump inhibitors, H_2 blockers, and antacids were most frequently prescribed (19.23%, n=260). Nutritional Supplements such as iron supplements, protein supplements, and Vitamin B_9 were the second most prescribed (17.6%, n=238). The overall detail is given in Fig. 2.

WHO core prescribing indicators
Core prescribing indicators according to the WHO are shown in Table 3. The average number of drugs per prescription was 9.28. Only 21.28% of drugs were prescribed by generic name, and 35.95% of the prescriptions had more than one antibiotic prescribed. 80.99% of the prescriptions had an injection prescribed. About 65.49% of the drugs were prescribed from the national essential drug list.

DISCUSSION

The main aim of studying drug utilization patterns is to encourage and facilitate rational use of drugs in every condition and to suggest some advice to improve, in case of evidence of polypharmacy and prescribing potentially inappropriate medication, to promote the well-being of the patient. It evaluates the trends of drug prescribing as well as the effectiveness of prescriptions, health-wise as well as financially. Results of drug utilization patterns encourage the health care professionals to consider effective and standard health care therapies [7,8]. Our study uses WHO prescribing indicators to highlight a better understanding of the prescribing pattern in patients with lung cancer.

In gender-wise distribution, among 242 patients, 57%; n=138 were male and 43%; n=104 were female. Similar studies were also reported by Bepari *et al.* [9]. In age-wise distribution, majority of the patients with lung cancer belonged to the age group of 61–70 years (36%, n=88) with a mean and standard deviation of 64.9±2.63.

Our study showed that the average number of drugs per prescription was 9.28, which was higher than the optimal value. This was in correspondence with the study conducted by Mugada *et al.* and Mathew *et al.* where the average number of prescriptions was 8.16 and 9.63. This value was also higher than the optimal value as per the WHO core prescribing index [10,11]. Although it may look like polypharmacy, it must be noted that the prescribing pattern may differ in a clinical setting. Chemotherapy can cause severe side effects even in therapeutic dose. Hence, adjuvant therapies like antiemetics, analgesics should be prescribed for supportive care [10-12].

The percentage of drugs prescribed by generic study in our study was 21.28%. A study conducted by Bepari *et al.* and Mugada *et al.* has the value of 76.9% and 93%. Prescribing medicines by generic name must be strengthened. High number of percentage of drugs prescribed by generic name may be due to financial incentives to prescribers by

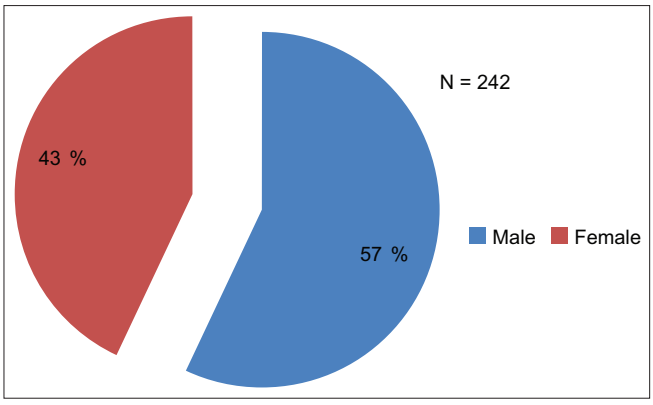

Fig. 1: Gender distribution of patients

Table 1: Age-wise distribution of lung cancer

Age range	Male (n=138)	Female (n=104)	No. of patients	Percentage
21–30	5	4	9	3.71
31–40	11	7	18	7.43
41–50	20	17	37	15.28
51–60	25	21	**46**	**19.00**
61–70	51	37	**88**	**36.36**
71–80	26	18	44	18.18

Table 2: Functional classification of cytotoxic drugs

Functional classification of cytotoxic drugs (n=221)	
Platinum compounds	
Cisplatin	29.34%, n=71
Carboplatin	6.61%, n=16
Taxanes	
Paclitaxel	9.09%, n=22
Docetaxel	1.24%, n=3
Antimetabolites	
5-Fluorouracil	14.05%, n=34
Gemcitabine	4.96%, n=12
Topoisomerase inhibitors	
Irinotecan	0.41%, n=1
Etoposide	10.33%, n=25
Cyanogenic diglycoside	
Amygdalin	7.44%, n=18
Tyrosine Kinase inhibitors	
Erlotinib	2.48%, n=6
Geftinib	3.72%, n=9
Alkylating agents	
Cyclophosphamide	1.65%, n=4

Table 3: WHO core prescribing indicator

WHO core prescribing indicator	Findings (%)	Optimal value [9]
Average number of drugs per prescription	9.28	1.6–1.8
Percentage of drugs prescribed by generic name	21.28	100
Percentage of prescriptions with antimicrobials	35.95	20–26.8
Percentage of prescriptions with injections	80.99	13.4–24.1
Percentage of drugs prescribed from national list of essential drugs	65.49	100

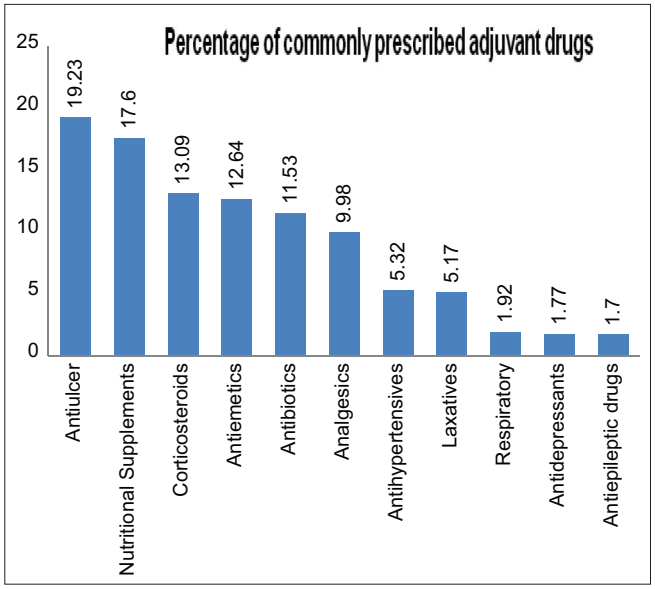

Fig. 2: Commonly prescribed adjuvant drugs

the pharmaceutical company [9,10]. Evenmore, drug prescription by generic name helps to improve rational prescribing of drugs, to avoid dispensing errors, and to reduce the cost of the therapy, thus reducing the overall medical expenditure [11].

The percentage of injections encountered was 80.99%, which was higher than the optimal value. Studies conducted by Mugada *et al*. and Kamlekar *et al*. was 75.5% and 100%, respectively. A higher number of injections may be because premedication given along with cytotoxic drugs is prescribed in injectable form [10,13].

The percentage of prescriptions with antibiotics was 35.95%. This value was within the range of the prescribing indicator but was in contrast to the study done by Mugada *et al*. and Mathew *et al*., with a value of 54.8% and 83.91% [10,11]. The use of antibiotics was limited only to any infection caused by side effects of chemotherapy, fungal infections.

The percentage of drugs prescribed from the essential medicine list was 65.49%. A similar study was observed in a study done by Kamlekar *et al*., in 2020. The prescription pattern may differ among clinicians. This could be the reason behind the deviation from the optimal value. Prescription of drugs from the essential drug list should be encouraged.

The effective prescribing of anticancer drugs is based upon the availability of drugs, cost, tolerance, efficacy, and progression of cancer in the patient. Detailed pharmacovigilance and efficacy are not effectively reported. Hence, it is better to prescribe already established drugs that are effective and for which the side effect profile is well known. Twelve anticancer drugs were prescribed during the study period; among which cisplatin was most commonly prescribed, followed by 5-fluorouracil. These findings are consistent with previous findings [10,12].

CONCLUSION

In the present study, majority of the patients were in the age group of 61–70 years (36.36%). Males (57%) were more predominant than females (43%). Our study revealed a high prevalence of polypharmacy, prescribing through generic name and a low percentage of prescribing from the essential drug list. Unnecessary use of antibiotics was not observed. Among the 12 cytotoxic drugs available in hospital pharmacy, cisplatin and 5-fluorouracil were most frequently used. The most commonly used group of adjuvant medicines in our study was anti-ulcer and nutritional supplements. Overall, we can conclude that an effective intervention is needed to encourage the rational use of drugs.

LIMITATIONS

The study was conducted in only one government hospital, and the data may be less diverse. We may need large scale sample size.

ACKNOWLEDGMENTS

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CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

All volunteers gave informed consent. This study was approved by Kantipur Academy of Health Sciences-Institutional Review Committee.

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