ORIGINAL ARTICLE

An Observation Study to Evaluate the Drug Utilization Pattern for Oral Cancer Patients Receiving Chemotherapy Treatment at a Private and Government Tertiary Care Hospital in Jaipur City

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ABSTRACT

Background: As oral cavity and oropharynx cancers are the second most common type of tobacco-related cancer reported in Jaipur city so it is imperative to study the drug utilization pattern in these cancers.

Objectives: The objective of this study was to evaluate the trends in drug usage patterns for oral cancer patients in Jaipur city.

Methods: The prescriptions of oral cancer patients attending the outpatient department of SMS Medical College and Bhagwan Mahaveer Cancer and Research Centre from May 2017 to August 2017 were studied. They were studied for WHO Prescribing indicators for good prescribing practice.

Results: A total of 188 prescriptions were studied. Average number of drugs per prescription was 7.4±1.8. The combination of paclitaxel and carboplatin was the most frequently prescribed antineoplastic drug, prescribed to 29.8% of patients. The drafting of the prescriptions was of average quality. In 5% of the prescriptions, a diagnosis was omitted, and in 48% of the prescriptions, the patient's weight and/or body surface area (BSA) were omitted. Only 52% of the prescriptions contained the medications' generic names.

Conclusion: The quality of prescribing was fair and moderately acceptable. To ensure rational prescribing and safe and successful treatment of cancer patients, interventions such as new policy formulation and educational measures should be developed.

Keywords: Drug utilization, chemotherapy, oral cancers, prescribing pattern, WHO prescribing indicators.

INTRODUCTION

Non-communicable illnesses are the leading cause of early death in emerging nations like India. The number of non-communicable diseases in our countries is expected to reach 1.1 million annually, with a mortality rate of roughly 0.6 million [1, 2]. The primary reason for cancer-related deaths is malignancies associated with tobacco use [3, 4]. According to the national cancer registry programme of the Indian government, the four most common malignancies in men in the Jaipur area are tobacco-related (lung, tongue, mouth, and oesophagus), followed by prostate cancer [5].

World Health Organization (WHO) defines drug utilization research as "the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences" [6]. The primary treatment techniques for cancer are surgery, radiation, chemotherapy, and immunotherapy. Cancer chemotherapy follows a regular schedule that is given for the management of neoplasia, using either a single anti-neoplastic agent or a combination of anti-neoplastic drugs [7-9].

Since their irrational use has led to a significant health issue in the current medical system, it is crucial to evaluate trends in anticancer drug usage patterns. By monitoring the drug utilization patterns, the therapeutic efficacy can be improved and adverse drug reactions can be minimized [10, 11]. Monitoring drug use patterns contribute to improving the effectiveness of treatment and provide input to the physician to guarantee the prudent use of drugs in oncology. The goal of this study was to evaluate trends in the drug usage pattern for those medications used to treat those conditions in Jaipur

MATERIAL AND METHODS

This prospective observational study involved oral cancer patients being treated at SMS Medical College and Bhagwan Mahaveer Cancer and Research Centre in Jaipur. From May 2017 to August 2017. Before the commencement of the study, permission was obtained from the respective institutional ethics committees [Reference number: 3206/MC/EC/2017]. These centers are the major government and private referral centers for cancer treatment in Jaipur city so they were chosen for the study site. The inclusion criteria for the study were patients aged between 20 and 70 years and those diagnosed histologically with oral and oropharyngeal cancers. While pregnant and lactating women were not considered, patients with other comorbidities such as

end-organ damage and HIV/Hepatitis B infection were also excluded.

Sample size has been calculated using the formula:

$$N = Z^2 * P (1-P)/\sigma^2$$

Where P=Prevalence; σ=Precision, Here Z=3.96 ~ 4; P=0.14; σ=0.05 based on previous studies of Motghare VM *et al.* [12] in oral cancer patients. Based on the above calculations a total number of 188 patients were recruited in the study.

The data were collected over three month period at both sites, on two randomly chosen days of the same week of the month. An additional day was chosen randomly in the following week in case the estimated number of patients did not reach 8 per day. However, if that "additional day" was overlapping then to eliminate the overlap, lots were drawn randomly from the remaining days. In this way, based on the previous study, the desired sample size of 188 patients was achieved. If the estimated number of patients did not reach 8 per day, an additional day was chosen randomly in the following week Lots were drawn from the remaining days in case that "additional day" fell on a previously chosen day to overcome the overlap.

Thereafter the prescription records of the patients receiving chemotherapy at both hospitals were used to collect the data utilizing a specially designed data collection form. Demographic details of the patients such as name, age, gender, date of consultation, *etc.* were noted and the drugs prescribed in each prescription were recorded. Thereafter WHO core prescribing indicators were applied to every prescription to evaluate the parameters such as:

- The number of prescriptions with Polypharmacy
- Percentage of prescriptions with injectables
- Percentage of prescriptions with antibiotics,
- Percentage of drugs prescribed from the recent List of Essential Medicines of Rajasthan state.

WHO guide to good prescribing was then applied to evaluate the prescription-writing quality for the enrolled patients.

RESULTS

Out of 188 patients, 81 patients had oral cavity cancers while 107 patients had oropharyngeal cancers. There was male preponderance in our study (91.4%). The majority of the patients receiving chemotherapy treatment were in the age group of 41-50 years. Fig. **(1)** depicts that paclitaxel and carboplatin combination was the most frequently prescribed regimen to 29.8% of patients while Nimotuzumab and carboplatin combination and Cisplatin along with radiation were the less frequent regimen prescribed to only 11.2% of the patients.

In 46.4% of the prescriptions, Rx/superscription was omitted. While the diagnosis was not mentioned in 5% of
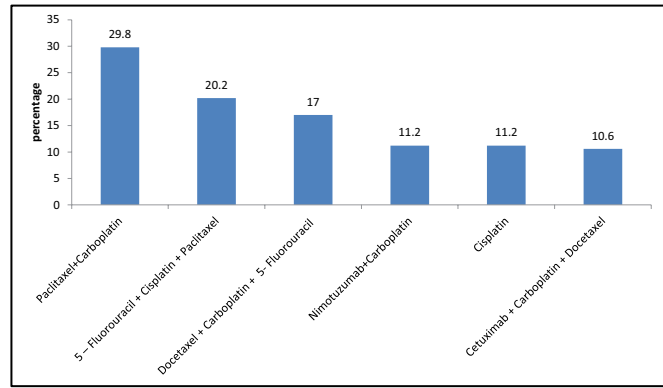

Fig. (1): Prescribing pattern of chemotherapy drugs.

the prescriptions, the patient's weight and/or body surface area (BSA) was missing in 48% of the prescription. Dosing instructions and route of administration were written for all antineoplastic medications prescribed in all the prescriptions. The number and duration of the cycle were also mentioned for all the antineoplastic drugs in all the prescriptions. Furthermore, only 52.2% of the drugs were prescribed by their generic names. The average number of drugs per prescription was 7.4±1.8 while the average number of cytotoxic drugs per prescription was 2.3±0.8. The average number of antibiotics per prescription was 0.25±0.1 (**Table 1**). The abbreviation was detected for names of the Paclitaxel, Carboplatin, and 5- Fluorouracil in all the prescriptions in which they were prescribed by their generic names. The most common adjuvant drugs being prescribed to the patients were anti-emetics 72.3% followed by anti-peptic ulcer drugs 24.4% as depicted by Table **2**.

Table 1: Analysis of prescription according to the WHO Prescribing Indicators.

WHO Prescribing Indicators	
Number of prescriptions analyzed	188
The average number of drugs per encounter (Mean + SD)	7.4+1.8
Percentage of encounters with antibiotics (other than cytotoxic antibiotics) prescribed (%)	8.2
Percentage of encounters with an injection prescribed (%)	100
Percentage of drugs prescribed by generic name (%)	52.2
Percentage of chemotherapy drugs from Rajasthan Essential Medicine List	71.4

Table 2: Prescribing pattern of various adjuvant drugs.

Drug Classes	Frequency	Percentage
Antiemetics and Prokinetics	136	72.3
Anti-peptic ulcer drugs	46	24.47
Steroids	23	12.23
Colony Stimulating factors	6	3.19
Antiallergics	10	5.3
Nutritional Supplements	34	18.08
Vitamins and Minerals	38	20.21
Antibiotics (Other than antitumor antibiotics)	46	8.2
Analgesics	32	17
Antianxiety drugs	5	2.65
Antipyretic drugs	3	1.59
Others	2	1.06

DISCUSSION

The main objective of a drug utilization study is to encourage communities to use medications responsibly. In the present study, the combination of Paclitaxel and Carboplatin was shown to be the most frequently used class of cytotoxic medicines for treating oral cancers, and it was also the safest with the fewest adverse effects. These results are in line with earlier work by Murti *et al.* [13]. While a different earlier study by Motghare found that oral Cisplatin was the most frequently recommended treatment for individuals with oral cancer, followed by 5-fluorouracil, Paclitaxel, Carboplatin, and Docetaxel [12].

Along with cytotoxic medicines, adjuvant and supplementing therapeutic measures are also a vital part of cancer chemotherapy as they help to combat associated adverse effects in the patients receiving treatment. In our study, the average number of other drugs per prescription was 7.4±1.8 while the average number of cytotoxic drugs per prescription was 2.3±0.8. This is contradictory to findings of studies in Nepal and in Karnataka state in India, with an average number of 1.97 and 1.78 cytotoxic medications prescribed per prescription [14, 15]. Cytotoxic medications have been linked to some patients with severe acid reflux disease, which justifies the preventative and therapeutic prescription of proton pump inhibitors and H2 antagonists to the patients [16]. Each patient received an average of one antiemetic or anti-peptic ulcer medication prescription.

There were only 8.2% encounters with an antibiotic prescribed other than cytotoxic antimicrobials. The average number of antibiotics per prescription was 0.25±0.1. These results vary slightly from a previous study undertaken in Nepal where the percentage of non-antitumor antibiotics per prescription was 9.16 [14]. This is a positive finding that points to the rational prescription of antibiotics at both Jaipur city hospitals.

Despite advice to exclusively use generic names, not brand names, and to avoid abbreviations when prescribing, we discovered that only 52.2% of cytotoxic medicines were given out under their generic names [17]. 71.4% of the prescribed drugs were from the essential medicine list. These results signify irrational prescribing practices and this difference in our study was observed as the patients were recruited from private as well as government tertiary care hospitals in Jaipur city. Although in the government setting all the drugs were prescribed from Rajasthan Essential Medicine List by generic names but this was not the practice observed in the private setting.

In the studied antineoplastic prescriptions, the prescription writing quality was fair and only moderately unacceptable. While in another study undertaken in Iran only 8 of the prescriptions have diagnosis written in them, indicating poor quality of prescription writing [18]. This study highlights the importance of creating a drug therapeutic committee in every tertiary care hospital to promote the rational use of drugs. This committee can address all the discrepancies in prescribing practices by making changes and recommendations accordingly. Such committees can also make periodic reviews of the drugs being used off-label at the hospital and generate quality evidence – either in support or against the such practice – based on the benefit-risk analysis [19, 20].

One of the study's limitations was the restriction of the inclusion of prescriptions to just two of the primary tertiary care facilities of Jaipur city. However, despite these shortcomings, the study provides insight into the prescribing habits adopted at both private and government tertiary care centers of our city and also highlights the loopholes in good prescribing practices adopted for treating oral cancer patients.

CONCLUSION

The prescription-writing quality for the antineoplastic drugs was moderately acceptable and fair. Even though generic prescribing is required at government institutions, brand-name medications are still prescribed in the private sector. To ensure judicious prescribing in cancer patients, new policies and educational initiatives should be implemented.

ETHICAL APPROVAL

For the study, permission was obtained from the respective institutional ethics committees [Reference number: 3206/MC/EC/2017]. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the Helsinki declaration.

CONSENT FOR PUBLICATION

Written informed consent was taken from the participants.

AVAILABILITY OF DATA

The authors unanimously confirm that data supporting the results of this study are available in the article.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHOR'S CONTRIBUTION

All the authors contributed equally to the publication of this article.

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