

Prescribing pattern of anticancer drugs in the medical oncology department of a tertiary care teaching hospital

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ABSTRACT

Background: To study drug utilization of anticancer drugs in the oncology inpatient department (IPD) of Kamineni Hospitals, L.B. Nagar, Hyderabad, India. **Methods:** One hundred prescription records were screened and analysed as per the study parameters from the oncology IPD of Kamineni Hospitals, Hyderabad. Commonly used anticancer drugs were recorded; furthermore, different types of carcinomas were noted.

Results: Age group of patients was in between 04 and 80 years, 62 were females and 38 were male patients. The most common type of carcinoma was carcinoma of the breast (28%). Cisplatin was the most commonly used anticancer drug (29%). Adjuvant drugs were used in 98% of the patients.

Conclusions: Incidence of cancer is more in females than males. Adjuvant and cytoprotective drugs used may have had a bearing on the relatively lower incidence of adverse effects.

Keywords: Anticancer drug, Carcinoma, Drug utilization, Oncology

INTRODUCTION

Cancer is the second leading cause of death globally, second only to cardiovascular disease.¹ According to the National Institute of Cancer Prevention and Research (NICPR), the estimated number of people living with the disease in India is around 2.25 million and every year over 11,57,294 lakh new cancer patients are registered. In low and middle-income countries like India, cancer patients generally have a poorer prognosis when compared to

patients from high income countries due to relatively low cancer awareness, late diagnosis, and the lack of/inequitable access to affordable curative services.^{2,3}

The number of deaths due to cancer in India was estimated to be 813,000 in 2016 contributing to 8.3% of the total deaths.⁴ The leading types of cancer in India in 2016, among both sexes combined, were stomach cancer (9.0%), breast cancer (8.2%), lung cancer (7.5%), lip and oral cavity cancer (7.2%), pharynx cancer other than

nasopharynx (6.8%), colon and rectum cancer (5.8%), leukaemia (5.2%), and cervical cancer (5.2%).⁴

The main treatments in cancer include surgery, chemotherapy, and/or radiotherapy.⁵ Chemotherapy involves the use of low-molecular-weight drugs to selectively destroy tumour cells or at least limit their proliferation.⁶ Disadvantages of many cytotoxic agents include bone marrow suppression, gastrointestinal tract lesions, hair loss, nausea, and the development of clinical resistance. These side effects occur because cytotoxic agents act on both tumour cells and healthy cells.⁷

Drug utilization studies (DUS) create a sound medical and health economic basis for healthcare decision-making.⁸ Drug utilization studies are used as a potential tool in the evaluation of healthcare systems. Drug utilization research is defined as a distribution, prescription, and the use of drugs in a society with a special emphasis on the resulting medical, social, and economic consequences.⁹ It is important to realize that inappropriate use of drugs represents a potential hazard to the patients and an unnecessary expense.¹⁰ Drug utilization research may provide insight into the following aspects of drug use and drug prescribing:¹¹

- Pattern of use
- Quality of use.

METHODS

Aims and objectives of the present research was to study the drug utilization pattern of anticancer drugs and to study the incidence of various carcinomas in Kamineni Hospitals, L.B. Nagar, Hyderabad.

Study design

A prospective, observational and cross-sectional study.

Procedure

After obtaining permission from the concerned oncologist, information was collected from the inpatient records of the medical oncology department of Kamineni Hospitals, Hyderabad, between July 2018 to December 2018. A sample size of 100 was chosen for this study. Patients whose cancer was confirmed objectively by a medical oncologist, of any age and sex and those who received anticancer drugs (in any form) were included. Those who received anticancer drugs and radiotherapy and/or surgery were also included. Patients who received only radiotherapy and/or surgery were excluded from the study.

Inpatient record was critically studied for

- Age and sex of the patients.
- Type of carcinoma and its incidence.
- Use of different anticancer drugs.
- Route of drug administration.

- Single or combination therapy.
- Use of adjuvant and cytoprotective drugs.
- Any adverse drug reactions.

Statistical analysis

The collected data was analysed using descriptive statistics. The data was entered in Microsoft Excel (Windows 10; Version 2016). Descriptive statistics such as frequencies and percentage were calculated for demographic and clinical variables and represented in tables.

RESULTS

Data of n=100 patients was analysed as per study parameters.

Table 1: Incidence of various carcinomas.

Type of cancer	Percentage
Breast cancer	28%
Oral cavity carcinoma	6%
Ca. Buccal mucosa	1%
Ca. Floor of the mouth	1%
Ca. Retromolar trigone	1%
Ca. Soft palate	1%
Ca. Oropharynx	2%
Carcinomas of the gastrointestinal tract	12%
Ca. Oesophagus	3%
Ca. Rectum	6%
Ca. Rectosigmoid	1%
Ca. Caecum	1%
Ca. Colon	1%
Carcinomas of the genitourinary tract	25%
Ca. Cervix	6%
Ca. Ovary	8%
Ca. Endometrium	3%
Ca. Bladder	4%
Ca. Vulva	1%
Ca. Penis	2%
Ca. Testes	1%
Carcinomas of the respiratory tract	8%
Ca. Nasopharynx	2%
Ca. Lung	5%
Ca. Post cricoid	1%
Other carcinomas	21%
Ewing's sarcoma	1%
Glioblastoma multiforme	1%
Hodgkin's lymphoma	2%
Non-Hodgkin's lymphoma	3%
Teratoma	2%
Metastatic seminoma	2%
Multiple myeloma	5%
Non seminomatous germ cell tumour	2%
Renal PNET	1%
Unknown primary with metastases	2%

Amongst them, female patients were 62 in number and males were 38. A major 87% of these patients were in the adult (18 to 65 years) age group, 12% were elderly (above 65 years) and a mere 1% was a child (1 to 11 years).

Percentage of the occurrence of different carcinomas is shown in detail (Table 1).

The most commonly found carcinoma was breast cancer (28%). The other cancers have been divided/classified into various categories (as seen above) for ease of representation (Figure 1).

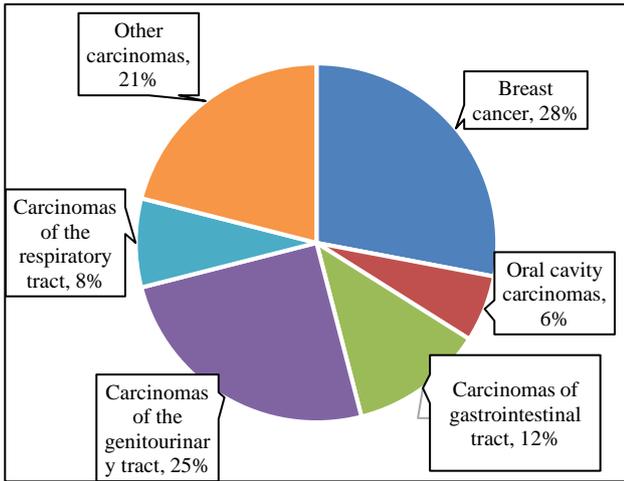


Figure 1: Incidence of various cancers and percentage.

A total of 24 different individual anticancer drugs were used. For ease of representation they have been classified as alkylating agents (cyclophosphamide, dacarbazine, temozolomide), antimetabolites (5-Fluorouracil, pemetrexed, gemcitabine), antibiotics (bleomycin, doxorubicin, epirubicin), platinum compounds (carboplatin, cisplatin, oxaliplatin), taxanes (paclitaxel, docetaxel), vinca alkaloids (vincristine, vinblastine) and others (bevacizumab, bortezomib, denosumab, trastuzumab, goserelin, etoposide, topotecan) (Figure 2).

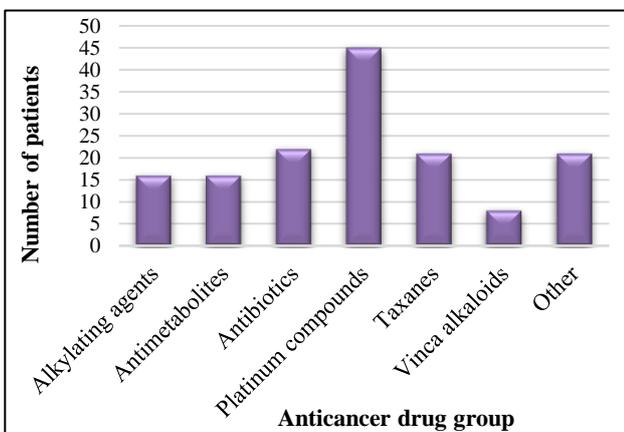


Figure 2: Different groups of anticancer drugs used.

Cisplatin was the most commonly used drug (29%), followed by paclitaxel (18%), doxorubicin (15%), cyclophosphamide (13%) and carboplatin (12%).

Intravenous route was the most commonly used route of administration for the anticancer drugs (95 patients) followed by subcutaneous (5 patients) and oral (1 patient).

Anticancer drugs were administered either singly or in combination. A major (63%) of patients received monotherapy while 37% received a combination of anticancer drugs. Doxorubicin and cyclophosphamide are the drugs which were most commonly used in combination therapy. The most commonly occurring combination was of 2 drugs (27%) and the least of 4 drugs (2%) (Table 2).

Table 2: Single and combination anticancer therapy.

Drug prescription	No. of patients prescribed in
Single drug	63
Combination	37
2 drugs	27
3 drugs	8
4 drugs	2

Adjuvant drugs were administered to 98% of the patients. The most routinely prescribed were ondansetron (97%), ranitidine (93%) and dexamethasone (97%) injections; and 91% of the patients received all the three drugs combined. Some other drugs used were furosemide, magnesium sulfate, potassium chloride and hydrocortisone. No adjuvant therapy was used in a minimal 2% of the patients (Table 3).

Table 3: Adjuvant drugs prescribed.

Adjuvant drug	No. of patients prescribed in
Ondansetron	97
Ranitidine	93
Dexamethasone	97
Furosemide	29
Magnesium sulfate	26
Potassium chloride	26
Hydrocortisone	24
Others	11
No adjuvant therapy	2

Cytoprotective drugs were used in a total of 8 patients, out of which 7 received leucovorin/folinic acid (mostly in patients who were prescribed 5-Fluorouracil) and 1 was given Peg Filgastrim (with trastuzumab).

Among the sample of patients in our study, 3 adverse drug reactions (ADRs) were found. Two patients experienced breathlessness, palpitations and sweating due to docetaxel. The other complained of giddiness and chest pain caused by paclitaxel.

DISCUSSION

The main aim of any drug utilization study is to promote the rational use of drugs in the general population. Work of this type provide a common basis for discussion, debate and policy-making. They also give us a powerful exploratory tool to document the role of drugs in society and provide statistical validity.

The prescriptions of the patients from the oncology inpatient department were studied. Present study shows that the incidence of carcinoma is high in females as compared to that in males (62 females vs. 38 males), Kulkarni et al, also found that the incidence of carcinoma in females is more than that of males and has written about it in his research article.¹²

As the risk of cancer increases with age, a similar pattern was seen in our study. A major 58% of patients were above the age of 50 years.

Among the many different types of cancers, the country-wise distribution differs according to various socioeconomic and ethnic aspects. As far as India is concerned, in females there is a greater incidence of breast cancer followed by genitourinary cancers.⁴

Present study also elucidated similar results with breast cancer being most common, followed by ovarian and cervical carcinomas. In males, oral cavity carcinomas account for the highest burden, followed by lung cancer.⁴ Present study sample for male patients was too small to comment on this, but around 11% were found to have both oral and lung cancer each.

Chemotherapy is one of the main management strategies along with radiotherapy and surgery in cancer. In malignant diseases drugs are used with the aim of cure or prolonged remission, palliation or adjuvant chemotherapy. In present study cisplatin was the most commonly used drug, followed by paclitaxel, doxorubicin, cyclophosphamide and carboplatin. Oncologists are using more injectable (especially intravenous) drugs than oral formulations.

Anticancer drugs were administered both singly and in combination. The fundamental principle of combination chemotherapy is that different drugs act through different cytotoxic mechanisms and prevent and/or slow the subsequent development of cellular drug resistance. A major issue with this cytotoxicity is that it is not specific, normal cells may also be damaged along with tumour cells.

Most anticancer drugs have many adverse effects ranging from severe vomiting to mutagenicity and carcinogenicity. The present study had only 3 ADRs, which was most likely due to the judicious use of adjuvant drugs like ondansetron and dexamethasone (for nausea and vomiting), ranitidine and many others. Cytoprotective drugs were also used especially along with antimetabolites.

CONCLUSION

From the present study we can conclude that the incidence of cancer is more in females than males. Carcinoma of the breast and genitourinary cancers are the most common types, with cisplatin being the most commonly used anticancer drug overall and in genitourinary cancers. In carcinoma breast, paclitaxel was the most commonly used drug followed by the combination of doxorubicin and cyclophosphamide.

Adjuvant and cytoprotective drugs were routinely used and may have a bearing on the relatively lower incidence of adverse effects.

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