

## PRESCRIPTION PATTERN OF ANTICANCER DRUGS IN A TERTIARY CARE HOSPITAL

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**ABSTRACT:** Carcinoma is one of the most common cause of morbidity and mortality all over the world. Chemotherapy is main stay of treatment with other modalities in the management. Present study had been conducted to evaluate prescribing pattern of anticancer drugs. An observational, retrospective study was conducted in the oncology department of ESI hospital over a period of one year. Data of patients greater than 19 years and diagnosed as carcinoma were included in the study. Out of 197 enrolled patients, majority were female (134, 68%) and in the age group of 41-60 years (147, 74.61% patients). Carcinoma of breast (58, 29.44%) was most commonly reported followed by carcinoma head and neck (46, 23.35%), and carcinoma cervix (34, 17.25%). Chemotherapy was commonly used as combination regimens (160, 81.21%). 5-Fluoro Uracil (5-FU) and platinum based combination were most frequently prescribed (60, 30.45%) especially in head and neck carcinoma (46, 23.35%). Platinum based combinations were also used in management of lung carcinoma. Dexamethasone, Ranitidine, Ondansetron, were used as palliative therapy either to prevent or manage adverse reactions of anticancer drugs.

**KEYWORDS:** Carcinoma, Chemotherapy, 5-FU, Prescription patterns, Adjuvant therapy.

**INTRODUCTION:** Cancer is a neoplastic disorder with multi factorial etiology.<sup>[1]</sup>

Being a dreadful disease, it brings psychological and social distress to the patients and relatives<sup>[2]</sup> and has become the important contributor to the global burden of disease.<sup>[3]</sup>

According to a survey by WHO, cancer was responsible for 13% of overall mortality in 2005 worldwide. In India, cancer is responsible for 10% of total mortality in 2002 which is expected to rise up to 25-50% by 2020.<sup>[4]</sup> Most frequent carcinomas reported in India were mouth, oropharynx, oesophagus, stomach and lungs, bronchus, trachea in males while carcinoma of cervix, breast, mouth, oropharynx and oesophagus in females.<sup>[5]</sup>

Chemotherapy remains one of the integral components in the management of carcinomas. Chemotherapy was used alone or in combination with other modalities of management (radiotherapy, surgery). Chemotherapy alone or as a component of multimodality approach has been shown not only to be effective but curative too in certain cases of squamous cell head and neck carcinoma, small cell and non-small cell lung carcinoma, breast carcinoma, cervix carcinoma, uterine carcinoma and colorectal carcinoma.<sup>[6]</sup>

The prescription pattern of anticancer drugs have changed significantly in the recent years because of better understanding of pathophysiology of carcinomas as well as introduction of newer drugs. Significant variation in the response rate of individual anticancer drugs, availability of different regimens, and intolerability of combination regimens necessitate observation and

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evaluation of cancer chemotherapy. Such information will help in optimizing antimalignancy therapy with improved efficacy and minimal toxicity.

## MATERIALS AND METHODS:

**Study type:** Observational, retrospective cross sectional study

**Study place:** This study was carried out at ESI Hospital Hyderabad.

The prescription patterns of patients diagnosed with carcinoma by oncologist were included. The collection of data was done from the in-patient medical record files from the year June 2011 to June 2012. The patient records fulfilling the inclusion criteria were selected and evaluated for the prescribing patterns. The patients belonged to the medical wards and the permission to conduct the study was approved by the Hospital administration department.

**INCLUSION CRITERIA:** All patients aged between 19-60 yrs receiving cancer chemotherapy in wards and also daycare was included.

The prescription patterns of 197 cancer patients fulfilled inclusion criteria and were studied.

**DATA ANALYSIS:** The data were subjected to analysis for:

1. Demographic details (Age and gender distribution).
2. Malignancy type.
3. Anticancer drugs prescribed.
4. Concomitant medications prescribed.

Results were expressed as proportions.

## RESULTS:

**Age wise and Gender wise distribution of patients:** Majority of patients were in the age group of 40 to 60 yrs. The age wise distribution of the patient showed that there was higher incidence of cancer in the age group of 50 to 60 years of age.

Cancer	Breast	Cervix	Ovary	Head/neck	Colon	Lung	Esophagus	CML	Rectum
M/F	0/58	0/34	0/9	24/22	6/3	9/0	3/1	4/0	3/0
<20yrs	0	0	0	0	0	0	0	0	0
20-30	2	0	0	2	1	0	0	1	0
30-40	8	2	2	15	2	1	1	2	0
40-50	22	8	6	18	4	2	2	1	3
50-60	26	24	1	16	2	6	1	0	0

Table 1: Age and gender wise distribution of patients

On analyzing the distribution pattern of cancer patients according to gender, the data represented that cancer was more prevalent in females than males.

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<b>Males</b>	<b>Females</b>
63(31.97%)	134 (68.02%)
<b>Total - 197 patients(N)</b>	

**Table 2: Gender wise distribution of patients**

**Types of cancers:** There were altogether 17 different types of cancer observed during the study period. The type of cancers observed with their corresponding number of patients and various regimens used were shown in Table 3.

**Table 3: Types, Regimens for various types of cancer and number of patients;**

Adriamycin + Cyclophosphamide (4 cycles) followed by Paclitaxel(4 cycles)	30 patients (51.72%)
5-FU+ Adriamycin+cyclophosphamide	9 (15.51%)
Paclitaxel + carboplatin	11 (18.96%)
Methotrexate+cyclophosphamide+5-FU	1 (1.72%)
Herceptin+Docetaxel	1(1.72%)
Epirubicin+endoxan	2(3.44%)
Gemcitabine+carboplatin	4(6.89%)
<b>Breast cancer (n=58)</b>	

<b>Carboplatin</b>	<b>14 Patients (41.17%)</b>
Cisplatin	17(50%)
Cisplatin+Ifosphamide	2(5.88%)
Carboplatin+Docetaxel	1(2.94%)
<b>Carcinoma cervix (n=34)</b>	

<b>Paclitaxel+carboplatin</b>	<b>6 patients (6.66%)</b>
Cisplatin +Paclitaxel	2(2.22%)
Cisplatin+ Etoposide	1(11.11%)
<b>Carcinoma Ovary (n=9)</b>	

Carboplatin+5-FU	24 (males) (52.17%)
Cisplatin + 5-FU	22 (females) (47.82%)
<b>Head and neck cancers (n=46)</b>	

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<b>5-FU+leuovorin</b>	<b>2 Patients (22.22%)</b>
5-FU+oxaliplatin+leuovorin	3(33.33%)
Irinotecan+5-FU+leuovorin	3(33.33%)
<b>Carcinoma colon (n=9)</b>	

Pemetrexed+carboplatin	6 patients (66.66%)
Carboplatin+ Paclitaxel	3 patients (33.33%)
<b>Carcinoma lung (n=9)</b>	

Paclitaxel + carboplatin	2 patients (50%)
Oxaliplatin + 5-FU	2 patients (50%)
<b>Carcinoma esophagus (n=4)</b>	

Imatinib	4 patients (66.66%)
Hydroxyurea	2 patients (33.33%)
<b>Chronic myelogenous leukaemia (n=6)</b>	

<b>Carcinoma rectum:</b> 5-FU+Irinotecan+leuovorin	<b>3 patients</b>
<b>NHL:</b> CHOP regimen	2 patients
Rituximab+CHOP regimen	2 patients
<b>AML:</b> Cytarabine+Daunorubicin	1 patient
All-trans retinoic acid+ cytarabine	1 patient
<b>Carcinoma stomach:</b> Docetaxel+carboplatin	1 patient
<b>Carcinoma tongue:</b> Taxol+carboplatin	3 patients
<b>Pancreatic cancer:</b> Gemcitabine	2 patients
<b>Bladder cancer:</b> Gemcitabine	2 patients
<b>Renal cell carcinoma:</b> Sunitinib	2 patients

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<b>Choriocarcinoma:</b> Methotrexate and leucovorin	5 patients
<b>Total</b>	<b>24(12.18%)</b>
<b>Others</b>	

Breast cancer was the most common cancer observed among females and head and neck and lung cancer were the most common cancers observed among males.

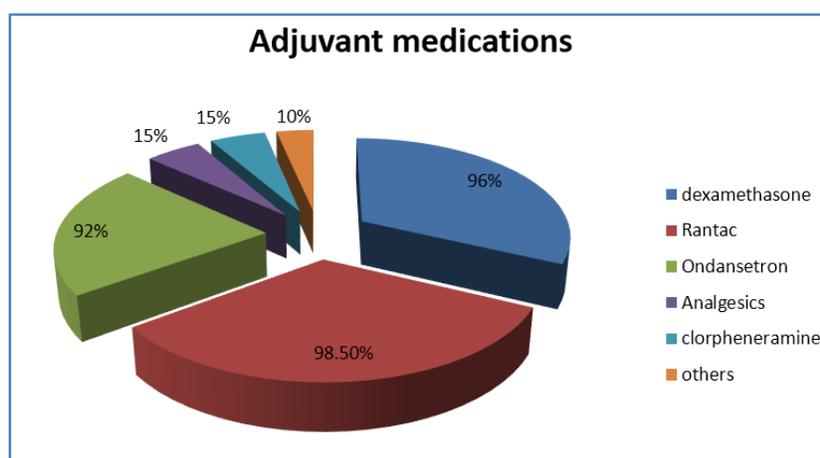
Regimen commonly employed for breast cancer was 4 cycles of Adriamycin +Cyclophosphamide followed by 4 cycles of Paclitaxel.

Among 197 prescriptions 26 anticancer drugs were used. Among them 5-FU and Carboplatin were the most commonly prescribed drugs.

<b>Drug - No. of Prescriptions</b>		
Paclitaxol-57 (28.9%)	Leucovorin-17(8.6%)	Methotrexate-6(3%)
Carboplatin-74(37.56%)	Gemcitabine-8(4%)	Ifosphamide-2(1%)
Cisplatin-44(22.33%)	Docetaxol-3(1.5%)	Etoposide-1
Adriamycin-45(22.8%)	Trastuzumab-1	Pemetrexed-6(3%)
Cyclophosphamide-46(23.3%)	Epirubicin-2(1%)	Imatinib-1
5-FU-69(35%)	Cytarabine-3(1.5%)	Hydroxyurea-2(1%)
Oxaliplatin-5(2.5)	Vincristine-4(2%)	Sunitinib-2(1%)
Irinotecan-6(3%)	Daunorubicin-1	Prednisolone-4(2%)
All –trans retinoic acid-1	Rituximab-2(1%)	

**Table 4: Prescription patterns of anticancer drugs**

## ADJUVANT MEDICATIONS USED:



**DISCUSSION:** In the present study, usage of chemotherapy alone as management modality was observed in 20.78% of patients for carcinoma cervix and renal cell carcinoma, pancreatic cancer, bladder cancer and chronic myeloid leukemia. Platinum compounds are well established

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drugs for carcinoma cervix. In the present study carboplatin and cisplatin were common anticancer drugs used.

Carcinoma breast was the most commonly observed carcinoma in the present study. Other commonly observed carcinomas are of head and neck, cervix, lung, ovary. These findings are consistent with observations of ICMR study 2006. Female to male ratio was high in this study (2.12%) which was similar to ICMR study. The greater prevalence of cancer in females can be because of the involvement of their reproductive system such as the cervical cancer, ovarian cancer and breast cancer which occupy the major portion among all other forms of cancer.<sup>[7]</sup> In our study, 77(39.08%) patients were above the age of 50 years. Out of these, majority of patients were in the age group of 51-60 years. Ageing related processes may be responsible for increased cancer prevalence at increased age.<sup>[8,9]</sup> Incidence of cancer increases as the age advances. According to the 1994 Surveillance, Epidemiology, and End Results Program of the National Cancer Institute, over 50% of all cancers occur in patients who are older than 65 years of age.<sup>[10]</sup>

Anticancer drugs were mostly prescribed in combination (160, 81.21%) in current study. This finding is consistent with the existing utilization pattern of anticancer drug.<sup>[11]</sup> Among combination chemotherapeutic regimens, 5-FU and platinum based combinations were commonly prescribed (60, 30.45%). Numerous experimental and clinical studies have revealed pronounced antitumor activity of cisplatin and 5-FU in various types of human cancers.<sup>[12,13]</sup>

Chemotherapy is especially required in advanced stages (III/IV) of head and neck cancers.<sup>[14,15,16]</sup> Cisplatin and continuous infusion of 5-FU have been established as the standard induction regimen for such advanced cases<sup>[15,16]</sup> with response rates of 20-50%.<sup>[15]</sup> In the present study, head and neck carcinomas were almost exclusively treated by this combination therapy of 5-FU and platinum compound.

Breast carcinoma is one of the most common neoplasms in women and is a leading cause of deaths worldwide.<sup>[17]</sup> Anthracyclines rank among the most effective anticancer drugs ever developed.<sup>[18]</sup> FAC, based on 5FU, Cyclophosphamide, and adriamycin is now the most commonly used, effective, well tolerated FAC regimen as adjuvant treatment for breast cancer patients and has shown survival benefit too.<sup>[19,20,21]</sup> In contrast to these findings, 5-FU, Cyclophosphamide and anthracycline combination usage for the management of breast carcinoma was prescribed in only 9 patients and in remaining 30 patients Cyclophosphamide and anthracycline combination is followed by four cycles of Paclitaxel.

Taxanes are the fundamental drugs used in the treatment of breast cancer. Because of convenient pharmacokinetic parameters and consistent positive clinical results paclitaxel is the preferred agent in this group. Addition of docetaxel or paclitaxel to the combination of doxorubicin and Cyclophosphamide has been observed with nearly equal in frequency in the present study too.<sup>[22]</sup>

Platinum is combined with taxel in most of the cases of cancer ovary, cancer lung and carcinoma esophagus and carcinoma of tongue. 5-FU, Irinotecan and leucovorin combination is preferred in carcinoma colon and rectum. Gemcitabine monotherapy was prescribed in bladder and pancreatic cancers.

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Nausea and vomiting are the most distressing side effects of cancer chemotherapy. Guidelines recommend the use of 5-HT<sub>3</sub> antagonists as antiemetics for acute and delayed nausea and vomiting for moderately and highly emetogenic chemotherapy<sup>[23]</sup> and the same group was preferred in present study too. As ondansetron is oldest among all the agents in this group and cheaper too, it should be preferred. In the present study, Ondansetron was more commonly prescribed (92%). Dexamethasone was given in nearly all the patients (189, 96%). Addition of dexamethasone to 5-HT<sub>3</sub> antagonists has been shown to improve the control of acute phase of chemotherapy induced vomiting.<sup>[24,25]</sup>

To summarize and conclude, anticancer drugs were almost always prescribed in combination. 5-FU and platinum based combination therapy was preferred in majority of cases (head and neck cancers, ca colon, ca esophagus) except in carcinoma of breast and lung. In breast carcinoma, Taxol, cyclophosphamide and anthracycline combination therapy was preferred while in lung carcinoma, platinum and taxol combination was prescribed. H<sub>2</sub> antagonist (ranitidine), 5-HT<sub>3</sub> antagonists (ondansetron), and corticosteroids (dexamethasone) were given in nearly all the cases to manage the adverse effects of anticancer drugs.

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