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Recommending form of anticancer drugs in oncology unit of a tertiary care teaching hospital

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ABSTRACT

Cancer has become a chief ailment and danger to the global society. It is one of the foremost reasons for demise in the world. A survey by the World Health Organization (WHO) indicates that 8.2 million people died from cancer in 2012 and it may rise to 19 million by 2025. Drug interactions connected through anticancer drugs are a global concern and should not be ignored. Nausea, vomiting or some other mild response to extreme myelosuppression may vary from adverse drug reactions. Analysis of prescription trend is a possible method in ascertaining the position of drugs in culture and it has to be taken out at every hospital regularly. The research is developed to examine the prescription pattern of anticancer drugs in the clinical oncology unit of a tertiary care centre in India. The patient's demographic data, medication name, type, dose, intensity and duration etc., have been analyzed in each prescription Commonly utilized anticancer narcotics and different forms of cancer were identified and the national essential drug list percentage of the medicines used was analysed. The current study intended to assess the tendencies and pattern of prescribing anticancer drugs. The prescribing practises were apposite and were in agreement with WHO strategies. The present study seemed to sustenance best proposing performs in order to endorse cost effective treatment and improved health care delivery.

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INTRODUCTION

Incessant upsurge in the amount of drugs and manifold choices in the treatment deliver an increased chance of inappropriate use of medicines, especially in conditions like cancer (Takiar *et al.*, 2010). A category of disorders of irregular cell-growth that can invade or expand to other parts of the body is referred to as cancer. Per year, 10 million people have cancer and globally, 6 million are killed (Williams *et al.*, 2001). In the next twenty-five years, there are predicted to be 300 million new tumours and 200 million cancer deaths worldwide, with about two thirds in developed nations (Bajracharya *et al.*, 2006). The combination of radiation therapy, surgery, chemical treat-

ment, and specialised treatment that lowers tumour dimensions and decreases tumour spread is widely used for cancer treatment. The chance of survival depends on the cancer type and the nature of the illness prior to surgery (Murthy *et al.*, 2011). Cancer chemotherapeutic agent is the medication used to destroy cancer cells (Grond *et al.*, 1994).The toxic effects of anticancer drugs have been well known since their introduction in the 1940s. Regular monitoring of the use of medications is one method of ensuring the protection and efficacy of medication from drug-related dangers for treatment. Patterns of prescription are a possible method to determine the role of medications in society. It is very helpful in strategies for healthcare. The sequence of prescribing is a medicine-related research procedure (Manichavasagam *et al.*, 2017). Inadequate use of medicines is a possible threat to patients. A periodic review of the use of medications is one approach to protect the quality and efficacy of medication against certain risks in patients. Doctors play a crucial role in making recommendations relating to the use of healthcare services in hospitals. In the case of medications, therefore, pharmacists are the links that link patients in their use of medicines. Pharmacists communicate with their patients with their medicine by doing a prescription study. The current research is undertaken by pharmacists to evaluate the therapeutic use evaluation of anticancer medication in the division of oncology, to investigate the use of medicinal products in connection with the opioid treatment and to evaluate the prescription history for anticancer drugs used in the National essential drug list.

In view of limited data available on the utilization of anticancer drugs in this area and for timely updation of guidelines and to check adherence to it, the current study is planned with an attempt to analyze the prescribing pattern of anticancer drugs in Vinayaka Mission's Medical college, Karaikal.

MATERIALS AND METHODS

Study design and analysis

Retrospective, observational study of prescribing pattern of drugs in cancer patients using the case records of the patients admitted with cancer in Oncology unit of VMMC for the duration of 6 months (August 2019-January 2020) after obtaining Institutional Ethics Committee (IEC) clearance.

Demographic data, clinical data and treatment data were collected in the preformed Case recording form. Data obtained were entered in MS Excel sheet and analysed for prescribing pattern and WHO core indicators. Patients diagnosed with cancer and admitted for chemotherapy, individuals of either sex, patients who were prescribed at least one drug were included in the study. Patients who were discharged or have expired within 24 hours of admission were excluded from the study.

Statistical analysis

Microsoft Excel has entered the results (Windows 7; Version 2007). The data collected on demographic and medical factors that were described in table and figure were analysed with descriptive statistics, including frequencies and per cent. Graph pad prism 9.0 was adapted for statistical analysis and graph construction. At the end of the report, key WHO prescription indicators were gathered to classify the total percent of injectable prescriptions, percent of the Critical Drugs list prescribed prescriptions with polypharmacology.

RESULTS

Table 1: Age Group and Frequency

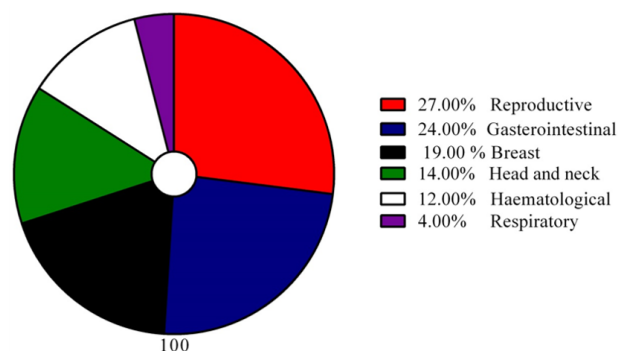| Age Group	Frequency	Percentage %
12-30 years	9	7.5
31-45 years	25	20.83
46-60 years	51	42.5
61-75 years	27	22.5
>75 years	8	6.66

Figure 1: System wise distribution of cancer

Age and gender distribution

A total of 120 patients' prescriptions were studied. The age wise distribution of patients is shown in Table 1. Majority of the cancer patients were in the age group of 46-60 years (42.5%). The age wise distribution reveals that there is a higher incidence in this age group of 46-60 years & less in the age group of 12-30 years (7.5%). Female preponderance (53.7%) of cancer cases was noted.

Distribution of cancer

Carcinoma of the reproductive system was found to

Table 2: Organ wise distribution of cancer

S.no	Diagnosis	Number of patients	Percentage
1	Ca Breast	23	19.16
2	Ca cervix	19	15.83
3	Ca rectum	8	6.66
4	Ca testis	8	6.66
5	Ca buccal mucosa	7	5.83
6	Ca oesophagus	6	5
7	Ca stomach	5	4.16
8	Ca lung	5	4.16
9	Ca ovary	5	4.16
10	Ca soft palate	5	4.16
11	Ca tongue	3	2.5
12	Hepatic carcinoma	1	0.83
13	Cholangiocarcinoma	1	0.83
14	Ca larynx	2	1.66
15	Ca colon	5	4.16
16	NHL	4	3.33
17	HL	2	1.66
18	AML	3	2.5
19	Lymphoma	4	3.33
20	Endometrial Carcinoma	1	0.83
21	Ca pancreas	3	2.5

Table 3: Prescription pattern of anticancer drugs

S.no	Anticancer drugs	Number of patients prescribed	Percentage
1	Carboplatin	28	11.86
2	Cyclophosphmide	26	11.01
3	Paclitaxel	20	8.47
4	Epirubicin	18	7.6
5	Cisplatin	18	7.6
6	Adriamycin	18	7.6
7	Pemitrexate	15	7.14
8	5FU	14	5.93
9	Bleomycin	12	5.08
10	Gemcitabine	12	5.08
11	Oxaliplatin	12	5.08
12	Capecitabine	10	4.23
13	Dactinomycin	9	3.81
14	Dacarbazine	6	2.54
15	Vincristine	5	2.11
16	Dalarubicine	4	1.69
17	Docelitaxel	3	1.27
18	Methotrexate	2	0.84
19	Ifosfamide	2	0.84
20	Bendamustin	1	0.42
21	Vinblastine	1	0.42

Table 4: Different types of treatment regimens/combinations used in cancer patients

| Diagnosis	% of patients	Treatment regimens used
Ca Breast	19.16	1.Docelitaxel+Adriamycin+cyclophosphamide 2.5FU+Epirubicin+ cyclophosphamide+ Radiation therapy 3.Docelitaxel+Carboplatin 4.Doxorubicin+ cyclophosphamide+ Radiation therapy 5. Paclitaxel
Ca cervix	15.83	1.Paclitaxel+Carboplatin 2.Paclitaxel+Cisplatin
Ca ovary	4.16	1.Ifosamide+cyclophosphamide 2.Paclitaxel+Carboplatin
Ca testis	6.66	Bleomycin+Etoposide+Cisplatin
Ca buccal mucosa	5.83	Paclitaxel+Carboplatin+Cisplatin+ Radiation therapy
Ca tongue	2.5	Docelitaxel+ Cisplatin + Radiation therapy
Ca lungs	4.16	Pamitrexate+Carboplatin
Gastrointestinal	24.16	1.Cisplatin/Carboplatin + Radiation therapy 2.Oxaliplatin+Capacetabine 3. 5-FU(5-Fluorouracil) + Radiation therapy 4.5FU + Oxaliplatin 5. Docetaxel, cisplatin + 5-fluorouracil 6. Gemcitabine + oxaliplatin
NHL	3.33	Oxaliplatin+Epirubicin
Lymphoma	3.33	1.Adriamycin+Dactinomycin+Vincristin 2.Bendamustine
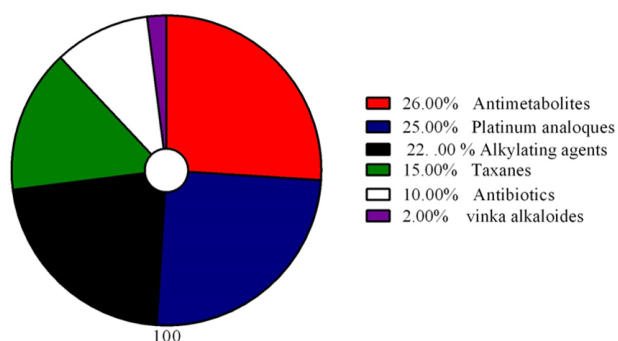
Figure 2: Anticancer drugs-class wise distribution

be more common (27.5%), followed by the gastrointestinal system (24.16%), as shown in (Figure 1). Carcinoma of the breast(19.16%) & Carcinoma cervix(15.83%) were the most common diagnosed type of cancer (16% patients), followed by Carcinoma rectum and carcinoma testis(6% patients each), as shown in Table 2.

Utilization pattern of anticancer drugs

In our study, various classes of anticancer drugs were prescribed, where Antibiotic, anticancer drugs (50.83%), Platinum analogues (48.16%) and Antimetabolites (44.16%) were the most commonly prescribed groups of anticancer drugs, followed by Alkylating agents, Taxanes & Vinka alkaloids groups of drugs (Figure 2). Carboplatin & cyclophosphamide (11% each) were the most frequently prescribed drugs, followed by Paclitaxel, Epirubicin, Cisplatin, Adriamycin, Pemitrexate & 5FU (Tables 3 and 4). Table 5 shows the combination of drugs used in the treatment of various types of carcinoma, where dual drug therapy was more frequently observed, followed by triple therapy (Table 6).

Dexamethazone (98.33%), Ondansetron (96.66%) & Ranitidine (96.66%) were the most commonly used adjuvants with anticancer drugs. IV fluids used almost in all patients (99.56%).

WHO core prescription indicators

A total of 236 anticancer drugs were prescribed, of which 41.80% & 77.92% drugs were prescribed from the WHO EML essential drug list and NLEM, respectively. 79.45% of the drugs were prescribed by their generic names. A prescription with generic names will reduce the overall cost of therapy. The majority of the drugs were given through the parenteral route (82.41%).

DISCUSSION

In this study majority of the cancer patients were in the age group of 46-60 years (42.5%) & there

Table 5: Adjuvant /supportive drugs prescribed

Adjuvant drugs	No.of patients prescribed	Percentage
Cytoprotective agents		
MESNA	3	2.5
Leucoverin	4	3.33
Filgrastim	8	6.66
Antiemetics		
Ondansetron	116	96.66
Palonosetron	04	3.33
Dexamethazone	118	98.33
Aprepitant	2	1.66
Anti-peptic ulcer drugs		
Ranitidine	116	96.66
Pantaprazole	64	53.33
Sucralfate	25	20.83
Anaelgesic		
Tramadol	67	55.83
Antibiotics		
Amikacin	15	12.5
Gentamycin	20	16.66
Piperacillin+Tazobactam	15	12.5
Metronidazole	14	11.66
Others		
Potassium chloride	62	51.66
Magnesium sulphate	61	50.83
Ethacrinic acid	6	5
Tranexamic acid	6	5
Zolpidem	3	2.5
Sibutramine	1	0.83
Antihistaminics	12	10
Diuretics	10	12
Multivitamin	28	23.33

Table 6: Prescription Pattern of anticancer drugs

S. No.	Indicator	Percentage
1	Average no of Anticancer drugs per prescription	1.96
2	Average no adjuvant drugs per prescription	6.5
3	% of Anticancer drugs prescribed by generic name	79.4%
4	% utilization of Anticancer drugs from WHO EML	–
5	% utilization of Anticancer drugs from NLEM	–
6	% of drugs prescribed as injections	82.41%
7	Average no of antibiotics per prescription	0.53

was a female preponderance (53.7%) which are similar to the findings of South Indian studies done by Manichavasagam *et al.* (2017); Shetty *et al.* (2019). The higher incidence of cancer in women may be attributed, among other cancer types, to the presence of their reproductive systems such as ovarian cancellation, breast cancer and cervical cancer (Ali *et al.*, 2011; Rajanandh *et al.*, 2018). Reproductive system (27.5%) and gastrointestinal system (24.16%) were the most commonly affected systems as per our study results. Breast cancer (19.16%) & Ca Cervix (15.83%) were the most common diagnoses (16% patients) in our study, followed by Ca rectum and testis (6% patients each). Manichavasagam *et al.* (2017) study also showed that breast cancer was the most prevalent cancer, which constituted about 32.96% of the total cases in that study (Manichavasagam *et al.*, 2017).

In our study, Antibiotic, anticancer drugs (50.83%), Platinum analogues (48.16%) & Antimetabolites (44.16%) were the most commonly prescribed class of anticancer drugs, followed by Alkylating agents. Alkylating agents and antimetabolites were the frequently prescribed drugs in the study (Manichavasagam *et al.*, 2017). In our study, Carboplatin & Cyclophosphamide (11% each) were the most frequently prescribed drugs. In a study done in Gulburga by *Guduru* H et al. also the finding was similar wherein most commonly prescribed anti-cancer drug is carboplatin and paclitaxel, followed by cyclophosphamide (Surendiran *et al.*, 2010). A study by Pentareddy *et al.* (2015) showed that platinum based combination was most frequently prescribed (60, 30.45%), especially in head and neck carcinoma (46, 23.35%).

In this study, different combinations of drugs were used to treat various types of carcinomas, wherein dual drug therapy was more frequently observed, followed by triple drug therapy. Platinum compounds were found to be combined with taxanes in most of the cases of Ovarian cancer, cancer lung, esophagus and carcinoma of the tongue. Paclitaxel was used as monotherapy in the treatment of a few cases of Ca Breast. Taxanes are the main medications used in breast cancer therapy. Paclitaxel is the favoured agent in this community due to flexible pharmacokinetic criteria and strong favourable clinical findings.

Regarding adjuvants used with anticancer drugs, Anti-emetics and anti-peptic ulcer drugs were the most commonly used agents. Dexamethazone (98.33%) & Ondansetron (96.66%) were the most common antiemetic used to prevent anticancer drug induced vomiting. Dexamethasone has been shown to be applied to 5-HT3 antagonists to enhance acute process regulation of vomiting chemotherapy (Barbour, 2012; Posner *et al.*, 2001). Palanosetron is an effective drug for chemotherapy induced vomiting in both early & late phase, but it was found to be less commonly(3.33%) used in our study. Injection Ranitidine (96.66%) was the most commonly used anti-peptic ulcer drug, followed by Injection Pantoprazole (53.33%) & these two agents were the common prechemotherapy medications. These results are comparable with the study results of (Shetty *et al.*, 2019), where the most commonly prescribed supportive care medications were found to be Dexamethasone (100%), Ranitidine (100%). Filgrastime(GCSF), MESNA & Leucovorine are the cytoprotective drugs used to prevent & manage the adverse effects caused by the chemotherapy agents in our study.

Magnesium sulphate infusion was given to the majority of the patients. Prophylactic magnesium supplementation can minimise the severity of cisplatin-induced renal damage without interfering with the anticancer effect of the drug (Lajer and Daugaard, 1999). World Health Organization core prescribing indicators reflect the overall prescribing pattern and rationality at a particular health care facility. In our study, a total of 236 anticancer drugs were prescribed at an average of 1.96 drugs per patient. The majority of the drugs were given through the parentral route (82.41%). 83% of the drugs were prescribed from WHO EML essential drug list. 79.45% of the drugs were prescribed by their generic names. Generic name prescriptions must be increased because generic medications are as effective as brand medicines and cost less than medical expenses.

CONCLUSIONS

To conclude, Breast & Cervical carcinomas were the most common malignancies noticed & cancer occurrence is found to be more in the age group of 46-60 years with female preponderance. Anticancer drugs were almost always prescribed in combination. Carboplatin & Cyclophosphamide based combination therapy, was preferred in the majority of cases. H2 antagonist (ranitidine), 5-HT3 antagonists (ondansetron) and corticosteroids (dexamethasone) were given in nearly all cases to manage the adverse effects of anticancer drugs. Most of the drugs were prescribed from WHO EML & NLEM. The practice of Generic drug prescription to be improved so that the economic burden of the patients can be reduced. Drug utilization studies have always helped in modifying the prescrip-

tion guidelines according to the pattern of diseases reporting to the healthcare centres. Further such studies with a larger sample size would guide clinicians towards rational drug prescribing.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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