Original Research Paper

Volume - 10 | Issue - 10 | October - 2020 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Pharmacology

DRUG UTILIZATION STUDIES ON ANTICANCER DRUGS IN CANCER OUTPATIENT DEPARTMENT OF THE GOVERNMENT MEDICAL COLLEGE, SRINAGAR, JAMMU AND KASHMIR, INDIA.

Sabahat Farooq* *Corresponding Author

Tauseef Nazir Vaidha

Samina Farhat

ABSTRACT Carcinoma is one of the most commonly used term in day to day lives now and of the most common cause of morbidity and mortality all over the world. Chemotherapy remains one of the gold standards for 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 pharmacology department of GMC hospital over a period of six months. Data of patients aged between 10 years to more than 80 years and patients diagnosed as carcinoma were included in the study. There were altogether 14 different types of cancer observed during the study period. Among 98 enrolled patients, majority were female 57 (58.2%) and in the age group of 60-69 (33.7%) years. Carcinoma of stomach (19, 19.4%) was most commonly reported followed by carcinoma of breast (13, 13.3%) and colon (11, 11.2%). Chemotherapy was commonly used as combination regimens .Among 14 types of CA's 37 anticancer drug regimen trails were used. Among them Cisplastin, Oxaliplatin, cyclophosphamide and 5-FU were the most commonly prescribed drugs in patients.

KEYWORDS : Carcinomas(ca's), Chemotherapy, Retrospective Crosssectional Study, Neoplastic Disease ,prescription Pattern.

INTRODUCTION

Cancer is a term used to define a neoplastic disease with multi factorial etiology in which cells abnormally divides without control and are able to invade to other tissues [1 2]. The worldwide problem of cancer endures to be on large scale because of the aging and growth of the world population and an increasing espousal of cancer triggering behaviors, particularly smoking, within economically developing countries and is a major public health problem worldwide. Cancer is the second most common cause of death in the US exceeded only by heart disease More than 1.8 million new cancer cases are expected to be diagnosed in 2020 and about 606,520 Americans are expected to die of cancer in 2020 which translates to about 1,660 deaths per day [3] Cancers like female breast, lung, and colo- rectal cancers are occurring in high frequencies in many economically developing countries, in addition to the disproportionately high burden of cancers related to infections [4]. According to the WHO annually people die of cancer in India with occurrence of 500,000, this number is expected to rise to 700,000 by 2015 [5]. In India, cancer is responsible for 10% of total mortality in 2002 which is expected to rise up to 25-50% by 2020 [6]. According to a survey by WHO, cancer was responsible for 13% of overall mortality in 2005 worldwide. 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 [7]. According to The National Centre for Disease Informatics and Research of the Indian Council of Medical Research (ICMR) at Bengaluru, India, 1.45 million cases of cancer were estimated to be diagnosed in 2016 and this burden is likely to become double in the next 20 years [8,9]. The world's population is expected to be 7.5 billion by 2020 and approximations predict that about 15.0 million new cancer cases will be diagnosed; with deaths of about 12.0 million cancer patients [10].

Chemotherapy as systematic therapy is one of the key components in the management of carcinomas and has an effect on the whole body by passing via blood stream. More than 80% of cancers in India present in advanced stages and palliative care and pain relief are essential to provide good quality life for these patients [11]. 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. [12]. The treatment array of anticancer drugs have altered significantly in the latest years because of better understanding of pathophysiology of tumours as well as introduction of newer drugs. The response rates have significant variations depending upon usage of individual anticancer drugs, availability of different protocols, side effects of the drugs and intolerability of combination regimens necessitate observation and evaluation of cancer chemotherapy.

MATERIAL AND METHODS

Study type: Observational, and retrospective cross sectional study

Study place: This study was carried out at Government Medical College Srinagar.

The prescription patterns of patients diagnosed with different categories of carcinoma by oncologist were included. The collection of data was done from the in-patient medical record files from the year June 2019 to November 2019. 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 10 to more than 80 years receiving cancer chemotherapy in wards and also day care were included. The prescription patterns of 98 cancer patients fulfilled inclusion criteria and were studied further.

DATA ANALYSIS:

The data were subjected to analysis for:

1. Demographic details (Age and gender distribution). Patient ID (identity number) Date of admission and reasons for admission, Age, Sex, History of cancer, Provisional diagnosis, Names of the drugs prescribed
2. Anticancer drugs prescribed in each type of malignancy.

RESULTS AND DISSCUSION

Types of cancers:

There were altogether 14 different types of cancer observed during the study period. The type of cancers observed with their corresponding number of patients and various regimens used are shown in Table 1 and Graph 3. The most common type of neoplasia in our study was recorded in age group of 60-69 years (33.7%) in females (58.2%) followed by 50-59 years (20.4%) and 70-79 years (19.4%) (Graph 1 and 2). Our study was in accordance with study which recorded that cancer prevalence was predominant in females n= 152 (67.25%) and at sixty years of age both males n=32 (14.15%) and females n=30 (13.27%) were having similar prevalence. Other authors also recorded that that the incidence of carcinoma is high in females as compared to that in males (267 females vs. 245 males) [13, 14, 15]. The incidence of carcinoma in females is more than that of males other authors also recorded majority were female (134, 68%) [1]. Furthermore, similar

findings are reported in research communication [11]. However, this study was contradictory to a study which recorded as male population was more effected (54%) and (46%) of patients were females [16]. CA stomach was the commonest type of neoplasia recorded in 19 (19.4%) patients and male population was more effected than females with most age group 60-69 years followed by CA breast in (13 .3%) patients in which overtly females were mainly presented with highest presenting age group of 50-59 years with equal number of CA Colon and CA ovary in 11 patients (11.2%) followed by other type of CA's (Graph 3, 4 and 5) and Lung CA in age group of mainly 70-79 years with percentage of 9.2% in nine patients Other types of Cancers that were present in the study population were CA GE Junction seven (7.1%), CA GB seven (7.1%), NHL in six (6.1%),CA oesophagus in five (5.1%), CA prostate in three (3.1%), Multiple myeloma in two (2.0%) CA rectum in two (2.0%) CA urinary bladder in two (2.0%) and Recurrent thymoma in one (2.0%). The age group and sex in other types of CA's is presented in Graph 3 and 4. Similar, studies presented Stomach cancer as a major contributor to the global burden of cancer and less than a century ago it was the most common cancer in the world however, the most common type of cancer recorded was breast cancer and few authors also observed breast cancer as leading cause followed by carcinomas of head and neck, cervix, lung, ovary [14,17]. Over 50% of the cancers occurs in patients who are older than 65 years of age according to 1994 Surveillance Epidemiology and End Results Program of the National Cancer Institute. [18]. 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% [1]

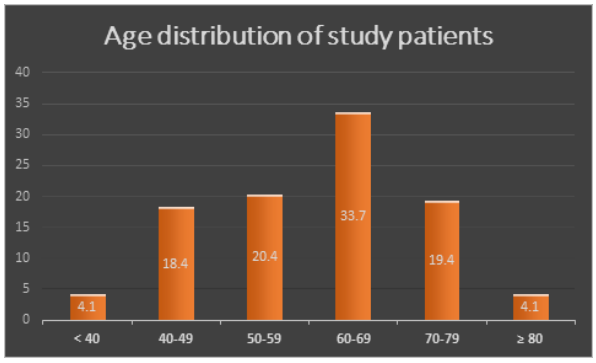
As, per GBD 2015 study reported that the most common types of cancer are prostate, lung and colorectal cancer in males and breast, colorectal and lung cancer in females. On the other hand, the leading causes of cancer deaths include lung, liver and gastric cancer in males and breast, lung and colorectal cancer in females and the most common cancers (at the global level) are breast and cervical cancer and the main causes of cancer deaths are leukemia and liver cancer [19].

Chemotherapy is defined as the administration of anticancer drugs that may be given with a therapeutic intention which mostly involves amalgamations of drugs given as a goal to prolong life or to shrink symptoms (palliative chemotherapy). Among 14 types of CA's 37 anticancer drugs regimen trails were used. Among them Cisplastin, Oxaliplatin, cyclophosphamide and 5-FU were the most commonly prescribed drugs in patients.

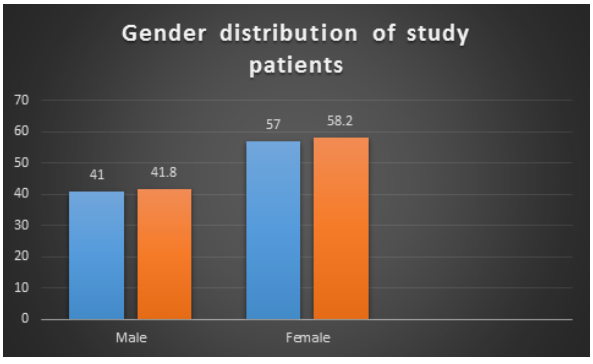
In our study anticancer drugs in combination of Epirubicin, Cisplatin and Capecitabine (36.8%) was used in CA stomach for seven patients, Oxaliplatin and Capecitabine (21.1%) in four patients. Epirubicin ,Cisplatin, Capecitabine and Apprepitant(10.5%) in two patients followed by other regimens. Adriamycin and Cyclophosphamide were most used drugs in CA breast in six patients (46.2%), Paclitaxel and Carboplatin in three patients (23.1%) followed by 5-FU and Cisplatin (7.7%) in one patient and other regimen (Table 2A).

In current study the drugs mainly used for CA colon included Oxaliplatin, CLV and 5-FU in four (36.4%), Oxaliplatin and Capecitabine in three (27.3%) and Oxaliplatin,5-FU and CLV in three (27.3%) patients followed by usage of other protocols. Paclitaxel and Carboplatin in nine patients and Cisplatin and Gemcitabine in two patients(18.2%) in cases diagnosed with CA ovary. Other drug regimens for different types of CA's (Table no 2 B). Among 14 types of CA's 37 anticancer drug regimens were used. Among them 5-FU and Carboplatin were the most commonly prescribed drugs.

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[1]. Carboplatin was the most commonly used drug, 136 patients (26.56%) received carboplatin. Paclitaxel was the second commonly used drug and 133 (25.97%) [14]. The frequently used class of drugs were Platinum analogues (17%) and less frequently were Taxanes (5%) [16].The most commonly prescribed regimen, used in breast cancer was combination of fluorouracil, epirubicin, and cyclophosphamide (FEC), (81%) which was used with or without docetaxel and trastuzumab in HER-2 positive patients. Other combinations of FEC + docetaxel and FEC + docetaxel + trastuzumab were received by 43% and 23% of patients, respectively. Regimens, such as docetaxel + trastuzumab, taxane and cyclophosphamide, or anthracycline and cyclophosphamide + paclitaxel (34%) [20].



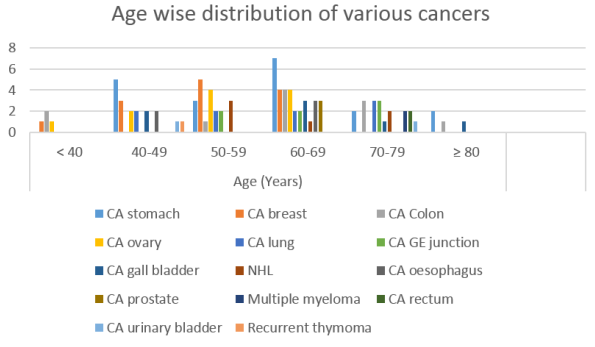
Graph 1 Age distribution of study patients



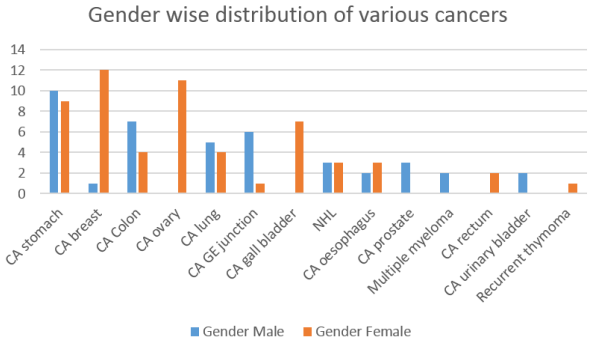
Graph 2 Gender distribution of study patients.

Table 1: Age wise distribution of various cancers

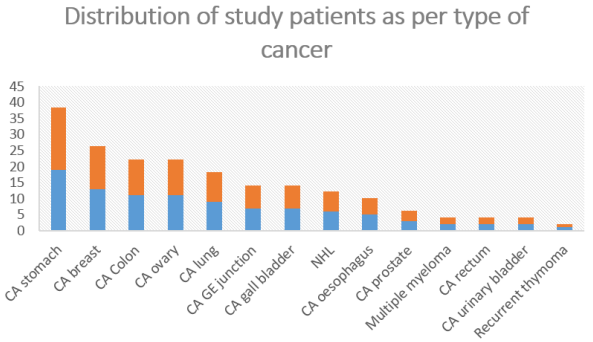
Type of Cancer	Age (Years)						b
	< 40	40-49	50-59	60-69	70-79	≥ 80	
CA stomach	0	5	3	7	2	2	19
CA breast	1	3	5	4	0	0	13
CA Colon	2	0	1	4	3	1	11
CA ovary	1	2	4	4	0	0	11
CA lung	0	2	2	2	3	0	9
CA GE junction	0	0	2	2	3	0	7
CA gall bladder	0	2	0	3	1	1	7
NHL	0	0	3	1	2	0	6
CA oesophagus	0	2	0	3	0	0	5
CA prostate	0	0	0	3	0	0	3
Multiple myeloma	0	0	0	0	2	0	2
CA rectum	0	0	0	0	2	0	2
CA urinary bladder	0	1	0	0	1	0	2
Recurrent thymoma	0	1	0	0	0	0	1
Total	4	18	20	33	19	4	98



Graph 3 Age wise distribution of various cancers



Graph 4 Gender wise distribution of various cancers



Graph 5 Distribution of study patients as per type of cancer

CONCLUSIONS

The global burden of cancer continues to increase mainly due to aging and growth of the world population and an increasing adoption of cancer causing behaviors particularly smoking, within economically developing countries. Female breast, lung and colo- rectal cancers are occurring in high frequencies in many economically developing countries, in addition to the disproportionately high burden of cancers related to infections. This is the second most common disease after cardiovascular disorders for maximum deaths in the world [3]. There are increasing number of cancer patients every year in India It is necessary to create awareness programmes by Government or NGOs. The programmed envisages control of tobacco related cancers, early diagnosis and treatment of uterine cervical cancer and distribution of therapy services, pain relief and palliative care through augmentation of health infrastructure. The diet and living style are important factors to control the spread of cancers and teen age students need to be targeted for spread of information and awareness among population.

Table 2A: Prescription pattern of anticancer drugs

Type of Cancer	Prescription Pattern	No.	%age
CA stomach	Epirubicin+Cisplatin+Capcitabine	7	36.8
	Oxaliplatin+Capecitabine	4	21.1
	Epirubicin+Cisplatin+ Capecitabine+Apprepitant	2	10.5
	Paclitaxel+Carboplatin	2	10.5
	Epirubicin+Cisplatin+5-FU	2	10.5
	Epirubicin+Cisplatin+Capecitabine	1	5.3
	Docetaxel+Cisplatin	1	5.3
CA Breast	Adriamycin+Cyclophosphamide	6	46.2
	Paclitaxel+Carboplatin	3	23.1
	5-FU+Cisplatin	1	7.7
	Docetaxel	1	7.7
	Adriamycin+Cyclophosphamide	1	7.7
	Doxorubicin+Cyclophosphamide +Paclitaxel	1	7.7
CA Colon	Oxaliplatin+CLV+5-FU	4	36.4
	Oxaliplatin+Capecitabine	3	27.3
	Oxaliplatin+5-FU+CLV	3	27.3
	Capecitabine+Grandem+Pantocid	1	9.1
CA Ovary	Paclitaxel+Carboplatin	9	81.8
	Cisplatin+Gemcitabine	2	18.2

Table 2B: Prescription pattern of anticancer drugs

Type of Cancer	Prescription Pattern	No.	%age
CA Lung	Paclitaxel+Cisplatin	5	55.6
	Paclitaxel+Carboplatin	2	22.2
	Docetaxel	2	22.2
CA GE Junction	Epirubicin+Cisplatin +Capecitabine	3	42.9
	Adriamycin+Cyclophosphamide	2	28.6
	Epiribicin+Oxaliplatin +Capecitabine	1	14.3
	5-FU+Cisplatin+Apprepitant	1	14.3
CA GB	Gemcitabine+Cisplatin	7	100
NHL	Rituximab+Cyclophosphamide+ Doxorubicin+Vincristin	3	50.0
	Rituxima+Bendamustine	2	33.3
	Doxorubicin+Vincristin	1	16.7
CA Oesophagus	Oxaliplatin+Capecitabine	5	100
CA prostate	Leucoperolide	2	66.7
	Rituximab+Cyclophosphamide	1	33.3
Multiple myeloma	Bortezomib+Zoledronic Acid	2	100
CA Rectum	Oxaliplatin+5-FU+CLV	2	100
CA urinary bladder	Gemcitabine+Carbaplatin	2	100
Recurrent thymoma	Doxorubicin+Cyclophosphamide +Cisplatin	1	100

REFERENCES:

1. Pentareddy, M. R., Suresh, A. V, Shailendra D, Subbaratnam Y , Prasuna G.\, Naresh, D. T, & Rajsekhar, K. (2015). Prescription Pattern of Anticancer Drugs in a Tertiary Care Hospital". Journal of Evidence based Medicine and Healthcare 2(20):3001-3009.
2. Kumar V, Abbas A, Fausto N Aster J Robbin's basic pathology 8th edition; 2010 Elsevier publications pp 173-217.
3. American Cancer Society. Cancer Facts and Figures 2020.
4. Jemal A, Bray F, Center M M, Ferlay J , Ward E & Forman D. (2011). Global cancer statistics. CA: a cancer journal for clinicians, 61(2):69-90.
5. Cancer incidence to rise five-fold in India by 2025; IANS | Feb 3, 2014.
6. World Health Organisation (2003). Introduction to drug utilisation research. Oslo: World Health Organisation.
7. ICMR Report (2006). Cancer Research in ICMR Achievements in Nineties.
8. Ferlay J, Soerjomataram I , Dikshit R , Eser S , Mathers C , Rebelo M, Parkin D M, Forman D & Bray F. (2015). Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. International journal of cancer 136(5): 359- 386.
9. National Centre for Disease Informatics and Research, National Cancer Registry Programme, Indian Council of Medical Research: three Year Report of Population Based and Hospital Cancer Registries; 2012-14. Available from: http://www.ncdindia.org .
10. Bray, F., & Møller, B. (2006). Predicting the future burden of cancer. Nature Reviews Cancer 6(1):63-74.
11. Takiar R, Nadayil, D & Nandakumar A. (2010). Projections of number of cancer cases in India (2010-2020) by cancer groups. Asian Pac J Cancer Prev, 11(4):1045-9.
12. Longo DL (2012). Chapter 84-Cancer cell biology and angiogenesis. Harrison's Principles of Internal Medicine 18th edition 693.
13. Sneha G , Aparna, S , Sri Lakshmi B N V B , Sravya Varma A & Raju Naidu D S. (2015). Adjunctive drug utilization pattern in oncology department of a tertiary care hospital in south India. Indo American Journal of Pharma Research 5(3):1297-1303.
14. Kulkarni M D , Hussaini S A , Padwal S L , Khandelwal P N , Doifode S M. & More P P . (2014). Drug utilization review of anticancer drugs in cancer outpatient department of the Government Medical College, Aurangabad. Int J Basic Clin Pharmacol 3(5):879.
15. Imran A, Wani W A and Saleem K. (2011). Cancer scenario in India with future perspectives. Cancer therapy 8.
16. Siddiqua, A. (2014). Drug utilization evaluation of anti cancer drugs. DUR of Anti-Cancer drugs 4(3):690-702.
17. American Cancer Society: Cancer Facts and Figures 2019. Atlanta, Ga: American Cancer Society, 2019.
18. Corcoran M E.1997. Polypharmacy in the older patient with cancer. Cancer Control 4:419-428.
19. GBD 2015 Mortality and Causes of Death Collaborators. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980-2015: a systematic analysis for the Global Burden of Disease Study 2015. The Lancet 2016; 388:1459-544.
20. Balkhi B, Alqahtani S , Altayyar W, Algawwa Y, Alqahtani Z , Alsaleh K & Asiri Y. (2020). Drug utilization and expenditure of anticancer drugs for breast cancer. Saudi Pharmaceutical Journal.